Vol. 1099 Number 1

OFFICIAL GAZETTE

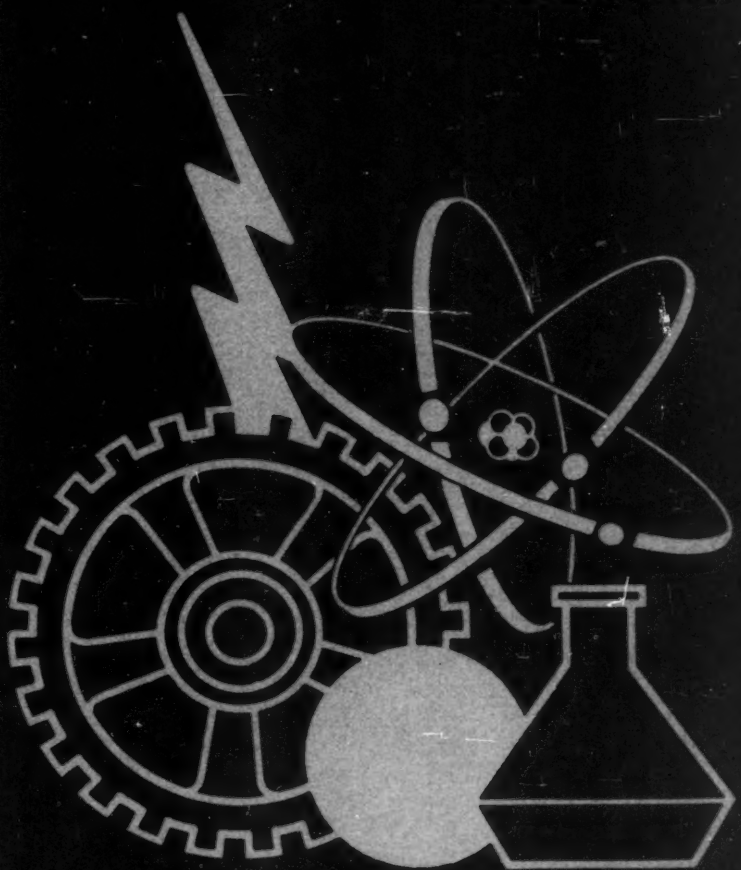
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

ute to:

PATENTS

February 7, 1989



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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

February 7, 1989 Volume 1099 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

The withdrawal of the Norwegian declaration under PCT Article 64(1)(a), that Norway shall not be bound by PCT Chapter II, as from Jan. 1, 1989, was announced at 1096 O.G. 34 on Nov. 22, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

Oct. 26, 1988.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct.

5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on February 4, 1986 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,567,611 through 4,569,085
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 26, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,313,229 through 4,314,378
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 20, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,483,020	06/442,304	11/20/84
4,483,027	06/387,972	11/20/84
4,483,031	06/488,366	11/20/84
4,483,038	06/530,781	11/20/84
4,483,039	06/537,427	11/20/84
4,483,050	06/412,212	11/20/84
4,483,057	06/335,826	11/20/84
4,483,059	06/486,565	11/20/84
4,483,068	06/324,896	11/20/84
4,483,071	06/363,762	11/20/84
4,483,073	06/402,925	11/20/84
4,483,078	06/418,445	11/20/84
4,483,080	06/361,835	11/20/84
4,483,085	06/559,103	11/20/84
4,483,086	06/397,107	11/20/84
4,483,087	06/337,445	11/20/84
4,483,088	06/462,231	11/20/84
4,483,095	06/597,649	11/20/84
4,483,099	06/597,691	11/20/84
4,483,102	06/422,459	11/20/84
4,483,104	06/363,520	11/20/84
4,483,112	06/329,710	11/20/84
4,483,114	06/373,391	11/20/84
4,483,115	06/367,446	11/20/84
4,483,118	06/224,677	11/20/84
4,483,119	06/507,700	11/20/84
4,483,127	06/388,178	11/20/84
4,483,129	06/426,151	11/20/84
4,483,132	06/465,982	11/20/84
4,483,140	06/290,015	11/20/84
4,483,143	06/423,528	11/20/84
4,483,152	06/515,216	11/20/84
4,483,153	06/484,394	11/20/84
4,483,155	06/392,617	11/20/84
4,483,162	06/376,258	11/20/84
4,483,163	06/395,490	11/20/84
4,483,175	06/450,698	11/20/84
4,483,189	06/518,336	11/20/84
4,483,197	06/430,535	11/20/84
4,483,198	06/455,673	11/20/84
4,483,199	06/421,115	11/20/84
4,483,214	06/477,121	11/20/84
4,483,222	06/297,495	11/20/84
4,483,223	06/482,721	11/20/84
4,483,225	06/450,360	11/20/84
4,483,233	06/431,395	11/20/84
4,483,238	06/432,202	11/20/84
4,483,245	06/439,856	11/20/84
4,483,248	06/481,749	11/20/84
4,483,250	06/485,083	11/20/84
4,483,257	06/491,366	11/20/84
4,483,261	06/464,410	11/20/84
4,483,263	06/614,580	11/20/84
4,483,264	06/364,545	11/20/84
4,483,269	06/268,357	11/20/84
4,483,278	06/493,210	11/20/84
4,483,287	06/376,688	11/20/84
4,483,290	06/363,270	11/20/84
4,483,298	06/592,738	11/20/84
4,483,301	06/413,900	11/20/84
4,483,302	06/460,437	11/20/84

Patent Number	Serial Number	Issue Date
4,483,309	06/495,737	11/20/84
4,483,311	06/521,291	11/20/84
4,483,312	06/403,484	11/20/84
4,483,313	06/464,697	11/20/84
4,483,315	06/337,703	11/20/84
4,483,317	06/352,935	11/20/84
4,483,321	06/408,461	11/20/84
4,483,324	06/494,702	11/20/84
4,483,327	06/389,030	11/20/84
4,483,334	06/483,622	11/20/84
4,483,337	06/431,335	11/20/84
4,483,339	06/584,765	11/20/84
4,483,344	06/473,262	11/20/84
4,483,347	06/356,326	11/20/84
4,483,365	06/402,457	11/20/84
4,483,372	06/489,390	11/20/84
4,483,374	06/438,171	11/20/84
4,483,375	06/380,106	11/20/84
4,483,376	06/415,420	11/20/84
4,483,378	06/484,318	11/20/84
4,483,386	06/423,010	11/20/84
4,483,392	06/364,391	11/20/84
4,483,400	06/527,969	11/20/84
4,483,413	06/448,762	11/20/84
4,483,414	06/508,069	11/20/84
4,483,427	06/460,275	11/20/84
4,483,436	06/327,571	11/20/84
4,483,440	06/316,129	11/20/84
4,483,445	06/431,219	11/20/84
4,483,447	06/382,203	11/20/84
4,483,451	06/450,798	11/20/84
4,483,455	06/409,874	11/20/84
4,483,461	06/280,282	11/20/84
4,483,463	06/403,609	11/20/84
4,483,488	06/485,493	11/20/84
4,483,501	06/494,432	11/20/84
4,483,509	06/390,324	11/20/84
4,483,515	06/411,710	11/20/84
4,483,525	06/535,424	11/20/84
4,483,531	06/399,416	11/20/84
4,483,533	06/427,691	11/20/84
4,483,535	06/446,643	11/20/84
4,483,540	06/597,874	11/20/84
4,483,545	06/469,354	11/20/84
4,483,546	06/361,352	11/20/84
4,483,548	06/427,596	11/20/84
4,483,550	06/517,630	11/20/84
4,483,555	06/404,189	11/20/84
4,483,558	06/323,902	11/20/84
4,483,567	06/378,209	11/20/84
4,483,568	06/416,929	11/20/84
4,483,573	06/396,811	11/20/84
4,483,578	06/421,129	11/20/84
4,483,580	06/419,387	11/20/84
4,483,589	06/448,142	11/20/84
4,483,599	06/494,309	11/20/84
4,483,616	06/400,192	11/20/84
4,483,625	06/485,023	11/20/84
4,483,635	06/436,248	11/20/84
4,483,636	06/490,303	11/20/84
4,483,637	06/393,318	11/20/84
4,483,641	06/461,338	11/20/84
4,483,644	06/418,232	11/20/84
4,483,647	06/387,516	11/20/84
4,483,655	06/426,222	11/20/84
4,483,657	06/427,593	11/20/84
4,483,662	06/407,311	11/20/84
4,483,675	06/459,635	11/20/84
4,483,680	06/560,737	11/20/84
4,483,685	06/477,115	11/20/84
4,483,699	06/474,348	11/20/84
4,483,704	06/437,299	11/20/84
4,483,715	06/519,439	11/20/84
4,483,722	06/381,197	11/20/84
4,483,732	06/587,427	11/20/84
4,483,742	06/469,679	11/20/84
4,483,748	06/420,413	11/20/84
4,483,754	06/585,177	11/20/84
4,483,774	06/590,147	11/20/84
4,483,776	06/505,507	11/20/84
4,483,789	06/513,953	11/20/84
4,483,796	06/409,164	11/20/84
4,483,813	06/495,539	11/20/84
4,483,824	06/434,066	11/20/84
4,483,831	06/402,315	11/20/84
4,483,834	06/463,364	11/20/84
4,483,842	06/518,988	11/20/84
4,483,850	06/466,621	11/20/84
4,483,882	06/518,953	11/20/84
4,483,895	06/394,895	11/20/84
4,483,909	06/276,148	11/20/84
4,483,922	06/378,441	11/20/84
4,483,941	06/414,216	11/20/84
4,483,963	06/506,776	11/20/84
4,483,968	06/537,346	11/20/84
4,483,978	06/379,354	11/20/84
4,483,992	06/406,791	11/20/84
4,483,994	06/468,428	11/20/84
4,483,996	06/468,427	11/20/84
4,484,005	06/466,299	11/20/84
4,484,006	06/502,877	11/20/84
4,484,007	06/488,281	11/20/84
4,484,031	06/390,536	11/20/84
4,484,033	06/339,429	11/20/84
4,484,045	06/408,375	11/20/84
4,484,056	06/339,439	11/20/84
4,484,062	06/401,094	11/20/84
4,484,063	06/397,838	11/20/84
4,484,064	06/401,635	11/20/84
4,484,066	06/417,394	11/20/84
4,484,081	06/592,734	11/20/84
4,484,082	06/568,301	11/20/84
4,484,086	06/428,580	11/20/84
4,484,092	06/360,123	11/20/84
4,484,094	06/529,580	11/20/84
4,484,095	06/449,784	11/20/84
4,484,106	06/417,177	11/20/84
4,484,109	06/319,660	11/20/84
4,484,132	06/241,507	11/20/84
4,484,140	06/371,043	11/20/84
4,484,151	06/524,694	11/20/84
4,484,156	06/359,299	11/20/84
4,484,171	06/467,740	11/20/84
4,484,175	06/429,987	11/20/84
4,484,186	06/323,659	11/20/84
4,484,190	06/267,327	11/20/84
4,484,198	06/363,390	11/20/84
4,484,202	06/417,277	11/20/84
4,484,216	06/377,975	11/20/84
4,484,233	06/431,262	11/20/84
4,484,253	06/535,732	11/20/84
4,484,288	06/325,218	11/20/84
4,484,297	06/308,972	11/20/84
4,484,318	06/475,816	11/20/84
4,484,322	06/562,997	11/20/84
4,484,332	06/384,292	11/20/84
4,484,343	06/355,611	11/20/84
4,484,350	06/526,691	11/20/84

Recission of Notice of Patent Expiration

The Notice of Expiration due to failure to pay maintenance fees for the following patent was published in the Official Gazette of Aug. 16, 1988, in error and is hereby rescinded:

Patent Number	Serial Number	Issue Date
4,451,214	06/418,743	5/29/84

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the

indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,627,313, Re. S.N. 283,506, Filed Dec. 7, 1988, Cl. 74/867, CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION, Yasuhito Sakai, Owner of Record: *Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Martin A. Farber, Ex. Gp.: 352

4,628,233, Re. S.N. 283,263, Filed Dec. 9, 1988, Cl. 318/306, MICROPROCESSOR BASE MOTOR CONTROL, Robert Bradus, Owner of Record: *Inventor,* Attorney or Agent: Christopher M. Brock, Ex. Gp.: 217

4,645,123, Re. S.N. 284,385, Filed Dec. 14, 1988, Cl. 229/69, CONTINUOUS, FILLED ENVELOPE ASSEMBLY WITH NON-MARGINAL SPACED FEED HOLES, Robert E. Ashby, Owner of Record: *Moore Business Forms Inc., Grand Island, N.Y.,* Attorney or Agent: Michael J. Keenan, Ex. Gp.: 241

4,685,212, Re. S.N. 278,239, Filed Nov. 30, 1988, Cl. 29/876, METHOD OF MANUFACTURING A JACK, Toru Masuda, et al., Owner of Record: *Hosiden Electronics Co., Ltd., Osaka, Japan,* Attorney or Agent: Felix J. D'Ambrosio, Ex. Gp.: 326

4,706,624, Re. S.N. 281,338, Filed Dec. 8, 1988, Cl. 123/321, COMPRESSION RELEASE RETARDER WITH VALVE MOTION MODIFIER, Zdenk S. Meistrick, et al., Owner of Record: *The Jacobs Manufacturing Co., Hartford, Conn.,* Attorney or Agent: Donald E. Degling, Ex. Gp.: 342

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,415,374, Reexam. No. 90/001,670, Requested: Dec. 15, 1988, Cl. 209/211, METHOD AND APPARATUS FOR VORTICAL SEPARATION OF SOLIDS, Nils Anders L. Wikdahl, Owner of Record: *Noss Co., Decatur, Ga.,* Attorney or Agent: Ledig, Voit, et al., Ex. Gp.: 130, Requester: Hydrocyclone Technology Inc., Stone Mountain, Ga.

4,479,821, Reexam. No. 90/001,671, Requested: Dec. 16, 1988, Cl. 71/93, N-PHENYLSULFONYL-N TRIAZINYLUREAS, Willy Meyer, et al., Owner of Record: *Ciba-Geigy Corp., New York, N.Y.,* Attorney or Agent: Unknown, Ex. Gp.: 120, Requester: E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.

Erratum

"All reference to Patent No 4,797,565 to Lawrence E. Lach, et al. of Ill. for 'CASCADE FET LCGIC CIRCUITS' appearing in the Official Gazette of Jan. 10, 1989 should be deleted since no patent was granted."

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Lee D. Tousignant, Santa Ana, Calif., Reg. No. 1,405,573, for the mark "PC II" and design, Canc. No. 16,551.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before Mar. 17, 1989:

Andrews, Richard L., 1400 S. Joyce St., #C-1205, Arlington, Va. 22202
Briscoe, Kurt G., 82 Christopher St., First Fl., Montclair, N.J. 07042
Butsky, Victor V., 148 River Oaks Blvd. East, Oakaville, Ont., Canada L6H 5N7
Caldwell, John W., Sr., 3344 - 5th St., SE., Washington, D.C. 20032
Corbin, John K., 307 Lorraine Dr., Rockville, Md. 20852
Dority, Carroll B., 813 Swan Creek Rd., Ft. Washington, Md. 20744
Krosnick, Freda L., 1118 Cresthaven Dr., Silver Spring, Md. 20903
Lastova, John R., 610 S. 21st St., Arlington, Va. 22202
Marantz, Sidney, 835 Gist Ave., Silver Springs, Md. 20910
McNagibm, Eukeeb N., m Bix 25m Cinnerce Ct., West, Toronto, Ont., Canada M5L 1A9
Pedersen, Nils E., 1400 S. Joyce St., Arlington, Va. 22202
Provost, Alain, Robic, Robic & Assoc., 1514 Docteur Penfield, Montreal, Que., Canada H3G 1X5
Rimrodt, Louis K., 2511 S. Grant St., Arlington, Va. 22202
Stallard, Wayland W., 4407 Garrison St., NW., Washington, D.C. 20016
Steinberg, Robert, 24434 W. Nicklaus Dr., #M4, Valencia, Calif., 91355
Watts, Charles R., 6517 Bruck Hearth Ct., Alexandria, Va. 22306
Williams, Howard S., 9519 Falls Rd., Rockville, Md. 20854

CAMERON WEIFFENBACH,
Jan. 9, 1989 *Director, Office of Enrollment*
and Discipline.

Survey of Registered Practitioners In Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 18, 1988 from the Office of Enrollment

and Discipline (OED) to all practitioners in patent cases whose last names begin with K through O. Enclosed with the letter was a data sheet which had to be completed and returned to OED as soon as possible. All data sheets returned to OED will be acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with CFR 10.11(b).

If your last name begins with K through O and you have not received a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after returning the data sheet to OED, please contact Patricia M. Jordan at (703) 557-1728.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

Dec. 12, 1988.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 7, 1989

B1 3,958,676	4,719,599	4,748,181	4,765,871
D. 295,052	4,720,732	4,748,409	4,766,251
D. 297,675	4,723,772	4,748,502	4,766,574
4,338,260	4,724,196	4,748,677	4,766,790
4,457,881	4,724,482	4,749,153	4,766,951
4,464,103	4,724,490	4,749,360	4,767,097
4,542,345	4,724,834	4,749,578	4,767,266
4,552,386	4,725,390	4,749,649	4,768,057
4,576,369	4,727,535	4,750,591	4,768,092
4,613,371	4,727,936	4,751,181	4,768,251
4,623,040	4,728,509	4,751,230	4,768,487
4,636,810	4,729,153	4,751,613	4,769,357
4,644,250	4,729,310	4,751,969	4,770,193
4,647,841	4,730,269	4,752,734	4,770,391
4,652,077	4,730,343	4,753,374	4,770,415
4,652,334	4,733,275	4,753,578	4,770,754
4,658,437	4,734,123	4,753,587	4,772,048
4,674,618	4,734,338	4,754,014	4,772,111
4,676,033	4,734,632	4,754,429	4,772,203
4,679,108	4,737,520	4,754,793	4,772,264
4,682,328	4,737,827	4,754,886	4,772,274
4,683,044	4,738,370	4,755,123	4,772,464
4,693,493	4,738,527	4,755,241	4,772,465
4,696,882	4,738,876	4,755,267	4,772,466
4,706,464	4,739,658	4,756,064	4,772,506
4,708,854	4,740,059	4,756,448	4,772,585
4,709,921	4,741,136	4,756,514	4,772,606
4,710,102	4,741,286	4,757,343	4,772,609
4,711,558	4,741,744	4,758,210	4,772,722
4,712,121	4,742,108	4,758,349	4,773,326
4,712,691	4,742,780	4,758,437	4,773,588
4,713,820	4,743,292	4,759,013	4,773,756
4,714,082	4,743,377	4,761,000	4,774,175
4,715,164	4,743,502	4,761,045	4,774,272
4,715,390	4,743,705	4,761,482	4,774,514
4,715,578	4,744,985	4,761,871	4,774,664
4,716,038	4,745,112	4,762,923	4,777,883
4,716,061	4,745,187	4,763,325	4,777,930
4,717,245	4,745,545	4,763,373	4,778,377
4,717,283	4,745,603	4,764,372	4,784,071
4,719,196	4,747,324	4,764,967	
4,719,221	4,747,731	4,765,144	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Commissioner of Patents and Trademarks
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Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
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Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
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Colorado	Denver Public Library	(303) 571-2347
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	B ston Public Library	(617) 536-5400 Ext. 265
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	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
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	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
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	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin —Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 31, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-10-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-4-87
BIOTECHNOLOGY, GROUP 180—S. N. ZAHARNA, Acting Director	1-21-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	1-20-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-24-86
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-8-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-27-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-28-87
DESIGN, GROUP 290—K. L. CAGE, Director	1-23-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—VACANT, Director	7-7-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—VACANT, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-22-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-4-88

Expiration of patents: The patents within the range of numbers indicated below expire during December 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,624,839 to 3,631,538, inclusive

Plant Patents ..... None

STATUTORY INVENTION REGISTRATIONS

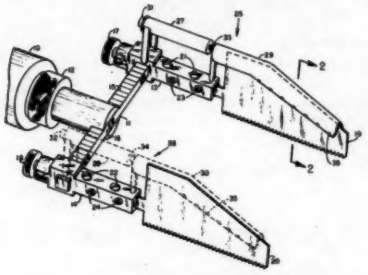
PUBLISHED FEBRUARY 7, 1989

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H571
DOUBLE-BLADED, WATER-COOLED ATTACHMENT FOR SURGICAL BONE CUTTING SAW AND METHOD FOR USING AND ASSEMBLING THE SAME

Jeffrey O. Hollinger, Glenwood; John P. Schmitz, Columbia, and Eric S. Koppelman, Bowie, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 20, 1986, Ser. No. 831,196
Int. Cl.[4] A61B *17/14*
U.S. Cl. 128—317 9 Claims

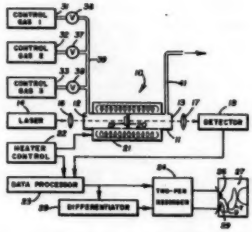


1. An attachment for a surgical saw motor comprising:
(a) means for connecting two surgical saw blades to said saw motor, so that two parallel cuts can be made simultaneously; and
(b) means for cooling said surgical saw blades and the bone areas adjacent thereto when said surgical saw blades are engaged in a cutting operation.

H572
OPTICAL ANALYZER

Anthony D. Hansen, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 28, 1987, Ser. No. 101,534
Int. Cl.[4] G01N *21/00*
U.S. Cl. 356—439 18 Claims

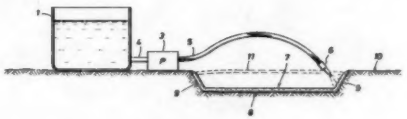


1. A method of analyzing particulate matter in which there is at least one sample of said particulate matter collected on a light transmitting filter comprising:
(a) passing a light beam through said sample,
(b) heating said sample and increasing the temperature thereof at a controlled rate,
(c) maintaining said sample in a controlled atmosphere as the temperature thereof is increased,
(d) detecting the intensity of light transmitted through said sample,
(e) determining the magnitude of transmission of light through said sample as the temperature of said sample is increased,
(f) determining the rate of change of the transmission of light through said sample as the temperature of said sample is increased,
(g) plotting said rate of change of transmission versus temperature on a chart.

H573
SEALING OF PITS

George M. Deeley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 30, 1987, Ser. No. 126,549
Int. Cl.[4] E02D *3/00*
U.S. Cl. 405—270 7 Claims

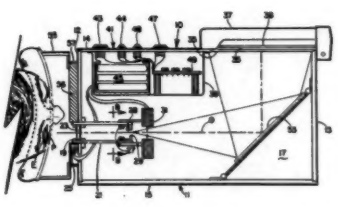


1. A method for sealing the bottom of a pit to minimize leakage from the pit, comprising:
mixing a sealing material in a fluid mixing tank;
connecting a pump and hose to the fluid mixing tank;
dispensing a layer of the sealing material from the fluid mixing tank through the pump and hose and onto the bottom and sides of the pit; and
allowing the dispensed layer of sealing material to seal the bottom and sides of the pit.

H574
SUBJECT OPERATED PUPILOMETER

Harold S. Merkel, and David P. Ramer, both of Beavercreek, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1987, Ser. No. 90,481
Int. Cl.[4] A61B *3/02, 3/14*
U.S. Cl. 351—223 4 Claims



1. An instrument for the self-administered measurement of the pupil of the eye of a subject, comprising:
(a) a controllable light source for selectively illuminating said eye of said subject;

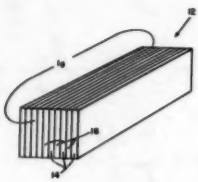
(b) optical means for projecting along an optical axis an image of said eye so illuminated;
(c) photographic film disposed along said optical axis for recording said image of said eye, said film disposed a preselected distance from said optical means providing a predetermined magnification of said image of said eye on said film;
(d) a substantially transparent plate having thereon a set of calibrated lines disposed along said optical axis adjacent said film for superimposing a set of calibrated lines onto said image of said eye;
(e) a controllable shutter disposed along said optical axis for slectively exposing said film to the superposition of said image of said eye and an image of said calibrated lines; and
(f) a light shield surrounding said light source for resiliently contracting the face of said subject and excluding extraneous light from said optical means.

H575

LIGHT-WEIGHT NON-SATURATING SPACED CORE INDUCTOR

Charles S. Kerfoot, Pasadena, and Walter E. Milberger, Severna Park, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1988, Ser. No. 189,459
Int. Cl.[4] B32B *15/10*; B22F *7/00*; H01F *27/24*
U.S. Cl. 428—464 4 Claims



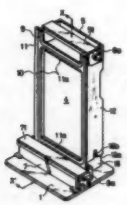
1. A light weight non-saturating spaced core inductor including a core structure made of alternate layers of magnetic material and non-magnetic material to form a light weight core.

H576

ELECTROPHERESIS APPARATUS HAVING SAFETY DEVICE

Sigeru Tezuka, c/o Fuji Photo Film Co., Ltd. No. 11-46, Senzui 3-chome, Asaka, Saitama, Japan

Filed Sep. 11, 1987, Ser. No. 97,619
Claims priority, application Japan, Sep. 11, 1986, 61-214882
Int. Cl.[4] B01D *13/02*; C25D *13/00*
U.S. Cl. 204—299 R 5 Claims



1. In an electrophoresis apparatus having a buffer solution vessel provided with an electrode and an electrically conductive terminal, said buffer solution vessel having a cover member capable of covering said vessel so that an operator's hands cannot touch a buffer solution within said vessel, wherein the improvement comprises said cover member being provided with an opening through which a power supply plug can be connected to said electrically conductive terminal, said cover member being pivotally connected to the vessel for rotational movement between an open position wherein the vessel is uncovered and a closed position wherein the vessel is covered, said power supply plug being arranged so as to be able to be connected to said electrically conductive terminal through said opening only when said cover member is in said closed position.

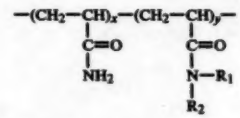
H577

AQUEOUS DRAG REDUCTION WITH NOVEL ACRYLAMIDE-N-ALKYL ACRYLAMIDE COPOLYMERS

Jan Bock; Ralph M. Kowalik, both of Bridgewater; Donald B. Siano, Fanwood, all of N.J., and S. Richard Turner, Pittsford, N.Y., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 28, 1987, Ser. No. 137,929
Int. Cl.[4] C08K *5/00*; C08L *39/00*
U.S. Cl. 524—555 7 Claims

1. A method for reducing frictional drag of water in flow through pipes comprising adding about 5 to about 100 ppm of a water soluble copolymer to said water, said copolymer having the formula:



wherein R_1 is an alkyl or cycloalkyl group having about to about 22 carbon atoms, R_2 is the same or different alkyl group as R_1 or hydrogen, x is about 90.0 to about 99.9 mole %, and y is about 0.1 to about 10.0 mole %, wherein the intrinsic viscosity of said copolymer is about 1 to about 10 dl/g.

H578

ELECTROLYTE ADDITIVE FOR LITHIUM RECHARGEABLE ORGANIC ELECTROLYTE BATTERY

Wishvender K. Behl, Ocean, N.J., and Der-Tau Chin, Winthrop, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 8, 1988, Ser. No. 153,611
Int. Cl.[4] H01M *10/08*
U.S. Cl. 429—197 14 Claims

1. In a lithium rechargeable organic electrolyte battery including lithium as the anode, a compound selected from the group consisting of titanium disulfide, molybdenum oxide, molybdenum sulfide, vanadium oxide, vanadium sulfide, and chromium oxide as the cathode, and a solution of an organic lithium salt in an organic solvent as the electrolyte, the improvement of using a large excess of lithium iodide in the solution as an electrolyte additive to provide overcharge protection.

H579

HIGHLY FLAME RETARDED FLEXIBLE POLYVINYL CHLORIDE COMPOSITIONS AND METHODS FOR PRODUCING SAME

Thomas P. Fidelle, and Robert J. Nulph, both of Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Oct. 26, 1987, Ser. No. 113,570
Int. Cl.[4] C08K *5/09*
U.S. Cl. 524—288 7 Claims

1. A method for flame retarding plasticized flexible polyvinyl chloride resin without significant adverse affect on thermal

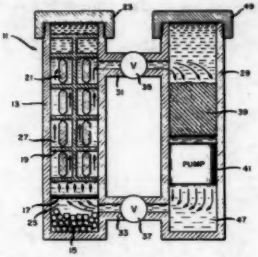
stability measured in accordance with ASTM procedure D2115 or tensile strength measured in accordance with ASTM procedure D638 of the resin comprising the step of incorporating therein an effective amount of di-2-ethylhexyl tetrabromophthalate and, optionally, a flame retardant enhancing agent.

H580

METHOD AND APPARATUS FOR GROWING HIGH PERFECTION QUARTZ

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the army, Washington, D.C.

Filed Jul. 16, 1987, Ser. No. 75,799
Int. Cl.[4] C30B *35/00*
U.S. Cl. 422—245 16 Claims



1. An apparatus for the hydrothermal growth of quartz comprising:

first and second autoclaves, said first autoclave containing seed crystals, nutrient and mineralizer;

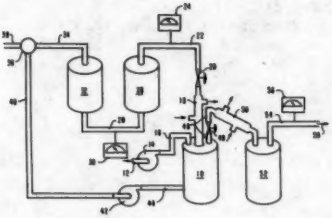
said second autoclave being connected to said first autoclave and containing means for filtering said mineralizer.

H581

MINERAL SPIRITS PURIFICATION PROCESS

Steven L. Collignon, Waldorf, and Dennis R. Knudsen, Fredericksburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 9, 1987, Ser. No. 71,502
Int. Cl.[4] C10G *17/00*
U.S. Cl. 208—254 R 9 Claims



1. A method of purifying mineral spirits contaminated with 1,2-propanediol dinitrate and hydrogen cyanide comprising:

(1) removing the 1,2-propanediol dinitrate and hydrogen cyanide by simultaneously

(a) heating the contaminated mineral spirits in a partially filled vessel at a temperature of from about 145° C. to the reflux temperature of the mineral spirits at atmospheric pressure to

(i) decompose the 1,2-propanediol dinitrate to gaseous decomposition products including hydrogen cyanide and nitrogen oxides and

(ii) drive the gaseous decomposition products from the mineral spirits into open portion of the vessel,

(b) purging the gaseous decomposition products from the vessel with a stream of a carrier gas, and

(c) removing the hydrogen cyanide and nitrogen oxides from the carrier gas;

and when the concentration of 1,2-propanediol dinitrate in the mineral spirits has been reduced to an acceptable level,

(2) recovering the mineral spirits from the vessel by distillation.

H582

BLENDS FOR MAKING SKIN PACKAGING FILMS

John H. Tucker, 1885 Howell, Beaumont, Tex. 77706

Filed Mar. 17, 1987, Ser. No. 26,852
Int. Cl.[4] C08L *3/26*; C08J *37/00*
U.S. Cl. 524—427 20 Claims

1. A blend useful for extruding into skin packaging films comprising:

(a) about 75 to about 95.5% by weight of one or more ethylene/carboxylic acid copolymers;

(b) about 5 to about 20% by weight of high density polyethylene; and

(c) about 0.5 to 5% by weight of one or more particulate inorganic fillers.

H583

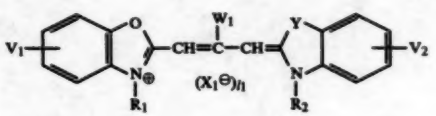
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Masahiro Asami, c/o Fuji Photo Film Co., Ltd., No. 210, Nakanuma, Minami Ashigara-shi, Kanagawa, Japan

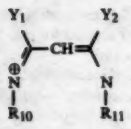
Filed Jan. 5, 1987, Ser. No. 503
Claims priority, application Japan, Jan. 8, 1986, 61-1865
Int. Cl.[4] G03C *1/30, 1/34, 1/20, 1/40*
U.S. Cl. 430—550 28 Claims

1. A color photographic light-sensitive material which comprises a support having provided thereon at least one light-sensitive emulsion layer containing a silver chlorobromide emulsion substantially free of iodide, wherein at least one of said light-sensitive emulsion layers containing a silver halide emulsion sensitized spectrally with a combination of at least one compound represented by the general formula

(I-A)



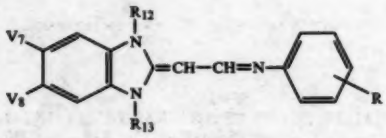
wherein W_1 represents a hydrogen atom, or an allkyl group; V_1 and V_2 may be the same or different, and each represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an amido group, an alkoxycarbonyl group or a cyano group, and further, V_1 and V_2 may be a condensed benzene ring; the number of each substituent represented by V_1 and V_2 which may be present in a molecule is one or more; R_1 and R_2 each represents an alkyl group, an alkenyl group or an aralkyl group, each of which may be substituted with a sulfo group, a sulfonate group, a carboxyl group, a carboxylate group or a hydroxyl group directly or through a divalent alkoxy group; Y represents an oxygen atom; X_1, represents a counter ion which can suffice for neutralization of charges in each molecule; l_1 represents 0 or 1, and l_1 is 0 when the molecules form an inner salt; and at least one compound represented by the general formula (II-A) or (II-B):



(II-A)

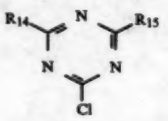
$(X_4^{\ominus})_{n2}$

wherein Y_1 and Y_2 each represents atomic groups necessary to constitute a benzoxazole nucleus, a naphthoxazole nucleus, a bezothiazo'e nucleus or a naphthothiazole nucleus, each of which may substituted with a halogen atom, a hydroxyl group, an alkyl group, an alkoxy group, an aryl group, a cyano group, a nitro group or an alkoxycarbonyl group; R_{10} and R_{11} each represents an alkyl group, an alkenyl group or an aralkyl group each of which may be directly substituted with a sulfo group, a sulfonate group, a carboxyl group, a carboxylate group or a hydroxyl group, or indirectly substituted therewith through a divalent alkoxy group X_4 represents a counter ion which can suffice for neutralization of charges in the molecule; and n_2 represents 0 or 1, and n_2 is 0 when the compound forms an inner salt;



(II-B)

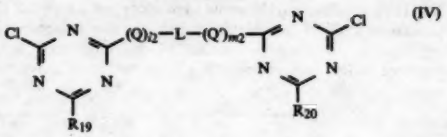
wherein R_{12} and R_{13} each represents an alkyl group, an alkenyl group or an aralkyl group, each of which may be substituted with a sulfo group, a sulfonate group, a carboxyl group, a carboxylate group, or a hydroxyl group directly or through a divalent alkoxy group; V_7 and V_8 may be the same or different and each represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an amido group, an alkoxycarbonyl group or a cyano group; and R represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an amido group, an alkoxycarbonyl group or a cyano group; and being hardened with at least one compound represented by the general formula (III) and/or at least one compound represented by the general formula (IV):



(III)

wherein R_{14} and R_{15} each represents a chlorine atom, —OM wherein M represents a hydrogen atom or a monovalent metal atom, an alkyl group, an alkoxy group,

wherein R_{16} and R_{17} each represents a hydrogen atom, an alkyl group or an aryl group, or —$NHCOR_{18}$ wherein R_{18} represents a hydrogen atom, an alkyl group, an aryl group or an alkylthio group, provided that the case of R_{14}=R_{15}=Cl is excluded herein;



(IV)

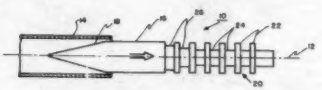
wherein R_{19} and R_{20} each represents a chlorine atom, —OM wherein M represents a hydrogen atom or a monovalent metal atom, an alkyl group or an alkoxy group; Q and Q' each represents —O—, —S—or —NH—; L represents an alkylene group or an arylene group; and l_2 and m_2 each represents 0 or 1.

H584

DIELECTRIC OMNI-DIRECTIONAL ANTENNAS

Felix Schwering, Eatontown, N.J., and Song-Tsuen Peng, Dix Hills, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 18, 1986, Ser. No. 943,229
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—785 **5 Claims**



1. An antenna comprising:

a solid dielectric cylindrical feed section having a uniform diameter;

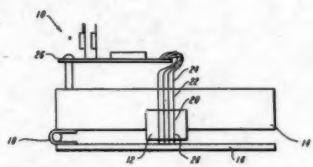
a solid radiating section extending from and integral withg said feed section and including a cylindrical tapered region whose diameter decreases outwardly from said feed section and extends for at least one wavelength, said radiating section including a plurality of periodically spaced corrugations having grooves therebetween, said corrugations being between 0.4 and 0.6 wavelengths apart and said grooves having gradually increasing depths in an intermediate length of said radiating section and having a constant depth in the end region of said radiating section.

H585

ANISOTROPIC MAGNETORESISTANCE MEASUREMENT APPARATUS AND METHOD THEREOF

John M. Cavallo, Beltsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 20, 1988, Ser. No. 146,012
Int. Cl.[4] G01R *33/02*
U.S. Cl. 324—249 **2 Claims**



1. Apparatus for measurement of magnetoresistance parameters of a film having a surface exposed to a magnetization comprising:

a support means, and

a plurality of contact points engagable with the surface of the film,

the plurality of contact points being supported by the support means for contact with the surface of the film and arranged in a pattern suitable for measuring the magnetoresistance parameters of the film according to the equation

$$\phi = \frac{IR}{4} \mathrm{Ln} \frac{(x+d)^2 + y^2}{(x-d)^2 + y^2} +$$

$$\frac{IR}{4} \mathrm{Ln}\left(1 + \frac{\Delta\rho}{\rho_0} \frac{((x+d)\cos\theta + y\sin\theta)^2}{(x+d)^2 + y^2}\right) -$$

$$\frac{IR}{4} \mathrm{Ln}\left(1 + \frac{\Delta\rho}{\rho_0} \frac{((x-d)\cos\theta + y\sin\theta)^2}{(x-d)^2 + y^2}\right)$$

wherein:

ϕ is the potential between the respective contact points,

I is the isotropic current

R is the isotropic resistance,

$(x \pm d)$ are the abscissa coordinates of the contact points,

y is the ordinate coordinate of the contact points,

$\Delta\rho$ is the magnetoresistance

ρ_o is the resistivity perpendicular to the magnetization, and

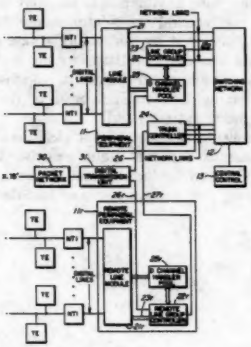
θ is the angle of the magnetization to the abecissa.

H586

ISDN D CHANNEL HANDLER

Randall D. Kun, 10 Cyrus Court, Nepean, Ontario, Canada (K2H 9C9)

Filed Mar. 16, 1987, Ser. No. 26,502
Claims priority, application Canada, Jun. 20, 1986, 512045
Int. Cl.[4] H04J 3/24
U.S. Cl. 370—94 **11 Claims**



2. A method for D channelizing informations destined for [ISDN]integrated services digital network (ISDN) subscribers' digital lines, comprising the steps of:

obtaining start addresses from a predefined output address queue, each start address defining the first of a series of storage locations wherein bit states destined for transmission to the ISDN subscriber digital lines are stored;

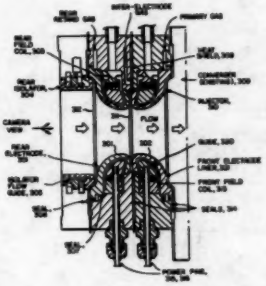
reading the storage locations one after another and distributing the read bit states in sequence into prearranged bit position occurrences in a bit stream being received by the ISDN subscribers' digital lines.

H587

DUAL TOROIDAL ELECTRODES

James H. Painter, St. Louis County, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 13, 1987, Ser. No. 111,238
Int. Cl.[4] B23K 9/16
U.S. Cl. 219—75 **6 Claims**



1. An electrical arc heater assembly for use with a supply of electrical power and a supply of pressured gas, said electrical arc heater assemply comprising:

a means for injecting a stream of gas into said heater assembly, said injecting means being connected to said supply of pressured gas and receiving pressured gas thereby;

a forward toroidal electrode mounted in said heater assembly and serving as a cathode;

first and second rear toroidal electrodes which are mounted in said heater assembly and respectively serving as a first and second anode to generate an electrical arc through said stream of gas to said cathode when said first and second anode and said cathode receive electrical power; and

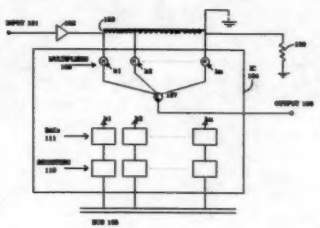
a means for conducting said electrical power from said supply of electrical power to said forward toroidal electrode and said first and second rear toroidal electrodes.

H588

TRANSVERSAL FILTER USED AS AN EQUALIZER FOR DATA READOUT FROM A DISK DRIVE

Paul W. Latham, II, Newmarket, N.H., assignor to Data General Corporation, Westborough, Mass.

Filed Oct. 13, 1987, Ser. No. 108,512
Int. Cl.[4] G11B 5/02
U.S. Cl. 360—65 **5 Claims**

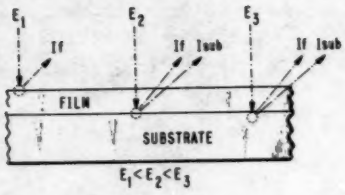


1. In a data storage device for storing data on a magnetic medium and having read heads for retrieving the data from the magnetic medium, an equalizer operatively connected to each read head comprising a transversal filter for equalizing the data from the read head.

H589
MEASUREMENT OF FILM THICKNESS OF INTEGRATED CIRCUITS

Richard G. Sartore, Bradley Beach, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 23, 1987, Ser. No. 43,271
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—307 1 Claim



1. A method of measuring the film thickness of integrated circuits comprising the steps of:

directing a narrow, high energy, electron beam to impinge upon an integrated circuit;

increasing in incremental steps of three or more the accelerating voltage of the electron beam so that the electrons penetrate into the film and with one or more further increases penetrate into the substrate of the integrated circuit to a predetermined extent;

the transmitted electrons serving to interact with the film and substrate materials to generate distinct X-rays;

detecting the generated X-rays;

the relative X-ray intensities of the film material to that of the substrate material being used to obtain a close estimate of the accelerating voltage required to penetrate the film;

determining the film penetration voltage in accordance with a least squares fitting of the relative X-ray intensity data points or readings; and

calculating the film thickness (T) in accordance with the formula:

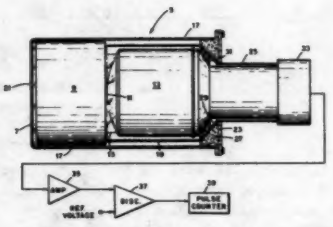
$$T=40\times E^{1.75}/P$$

where E=film penetration voltage, and p=film material density in mg/cm^3.

H590
HIGH-EFFICIENCY SCINTILLATION DETECTOR FOR COMBINED OF THERMAL AND FAST NEUTRONS AND GAMMA RADIATION

Marion M. Chiles, Knoxville; John T. Mihalczo, and Edward D. Blakeman, both of Oak Ridge, all of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 27, 1987, Ser. No. 19,738
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—367 6 Claims



1. A radiation detector for the combined detection of thermal neutrons, high-energy neutrons and gamma ray radiations, comprising:

a first scintillator means disposed to receive said radiations entering said detector through an entrance area thereof for producing scintillations in response to thermal neutrons absorbed therein and allowing said high energy neutrons and gamma rays to pass therethrough;

a second scintillator means disposed adjacent said first scintillator means to receive said high-energy neutrons and gamma rays passing through said first scintillator means for producing scintillations therein in response to high-energy neutrons and gamma rays absorbed therein and optically coupled to said first scintillator means for guiding light pulses therethrough generated by said scintillations produced in said first scintillator means;

a photomultiplier tube having a light sensitive face optically coupled to said second scintillator means for receiving light pulses generated by said scintillations produced in said first and second scintillator means and producing current pulses at an output thereof in response to each of said generated light pulses indicative of the total combined radiation count rate; and

a light-tight housing disposed about said first and second scintillator means and said light sensitive face of said photomultiplier and having a radiation pervious window therein forming said entrance area of said detector.

REISSUES

FEBRUARY 7, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,854

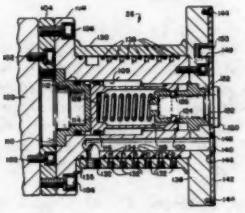
ADAPTER WITH MODULAR COMPONENTS FOR A ROBOT END-OF-ARM INTERCHANGEABLE TOOLING SYSTEM

Peter E. McCormick, Dallas, Tex.; Rick C. Edwards, Renton, Wash.; Walter D. Autry, Jr., Dallas, Tex.; Timothy D. Culbertson, Carrollton, Tex.; Jerome F. Goch, Dallas, Tex., and Marc S. Linder, Garland, Tex., assignors to EOA Systems, Inc., Dallas, Tex.

Original No. 4,676,142, dated Jun. 30, 1987, Ser. No. 728,763, Apr. 30, 1985. Continuation-in-part of Ser. No. 616,974, Jun. 6, 1984, Pat. No. 4,611,377. Application for reissue Oct. 20, 1987, Ser. No. 110,686

Int. Cl.[4] F01B *31/00;* **B25J** *17/02, 11/00*

U.S. Cl. 92—130 R **15 Claims**



8. An adapter for use in connecting a tool to the end of a robot arm, the tool having a locking element, comprising:

a first module for connection to the end of the robot arm;

means disposed on the first module for disengageably locking the tool to the adapter by means of rigid engagement with the tool's locking element;

at least one second module attached to the first module; and

a plurality of interface connectors disposed on the second module for establishing connections between the tool and interface passageways within the second module.

Re. 32,855

CAPACITOR-TYPE PULSE GENERATOR FOR ELECTRICAL DISCHARGE MACHINING, ESPECIALLY FOR WIRE-CUTTING EDM

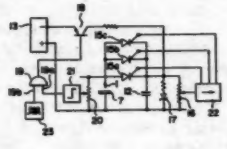
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Original No. 4,442,333, dated Apr. 10, 1984, Ser. No. 238,123, Feb. 25, 1981. Application for reissue Apr. 10, 1986, Ser. No. 851,792

Claims priority, application Japan, Feb. 26, 1980, 55-23574

Int. Cl.[4] B23P *1/08*

U.S. Cl. 219—69 W **10 Claims**



4. A method of operating a wire-cutting EDM, capacitor-type pulse generator comprising the steps of:

(a) charging a capacitor from a DC source, said capacitor being connected in series with a first switch means and a wire EDM gap, and said DC source having an ouptut voltage in excess of a predetermined level to charge said capacitor at an accelerated rate;

(b) generating a signal which is a function of capacitor voltage;

(c) upon said signal reaching said predetermined level, turning said first switch means into conduction to permit the charge on said capacitor to be discharged through said EDM gap; and

(d) upon said signal exceeding a preselected value, turning a second switch means connected in series between said DC source and said capacitor from a conductive state in which said capacitor is charged to a nonconductive state.

Re. 32,856

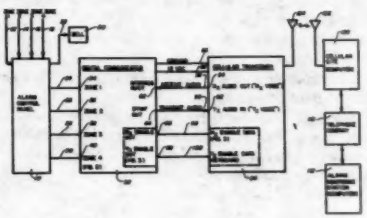
ALARM SYSTEM

James W. Millsap, Highland, Ind., and Peter Miller, Chicago, Ill., assignors to Peter Miller, 5659 N. Drake, Chicago, Ill.

Original No. 4,577,182, dated Mar. 18, 1986, Ser. No. 598,851, Apr. 10, 1984. Application for reissue Nov. 19, 1987, Ser. No. 122,440

Int. Cl.[4] G08B *1/08;* **H04M** *11/04*

U.S. Cl. 340—539 **11 Claims**



10. An alarm system for a protected premises at a fixed location, which comprises:

a digital communicator;

means for connecting an alarm signal line to said digital communicator;

a cellular transceiver, said cellular transceiver having an audio input and an audio output;

said digital communicator having an audio output and an interrogation input;

means coupling said digital communicator audio output to said cellular transceiver audio input;

means coupling said cellular transceiver audio output to said digital communicator interrogation input;

an antenna connected to said cellular transceiver, whereby an alarm signal received by said digital communicator will operate said cellular transceiver to transmit an over-the-air signal to a cellular site, where it can be forwarded to an alarm monitoring station with the alarm monitoring station being placed in two-way communication with the cellular transceiver via the cellular site.

Re. 32,857

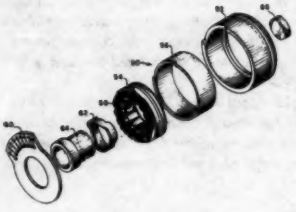
BRUSHLESS TACHOMETER/SYNCHRO

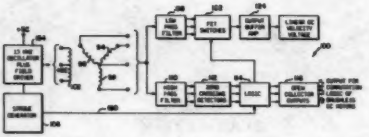
John R. Luneau, Center Harbor, N.H., assignor to Resolvex Corporation, Center Harbor, N.H.

Original No. 4,605,889, dated Aug. 12, 1986, Ser. No. 642,992, Aug. 21, 1984. Application for reissue May 12, 1987, Ser. No. 48,959

Int. Cl.[4] H02P *9/14;* G01P *3/46*

U.S. Cl. 322—61 13 Claims





12. A generator comprising

a stator;

means for providing a magnetic field associated with said stator including a constant field and an alternating field having a frequency of alternation;

a brushless rotor movable within said stator to selectively couple said constant field and said alternating field and generate a composite field signal;

pickup means associated with said stator to detect said composite field signal;

means to separate said composite field signal into a first and second field signal; and

output means including commutator means timed by said frequency of alternation and receiving said first field signal to generate a first output signal correlated to the position of said rotor within said stator.

Re. 32,858

STORED-PROGRAM CONTROL MACHINE

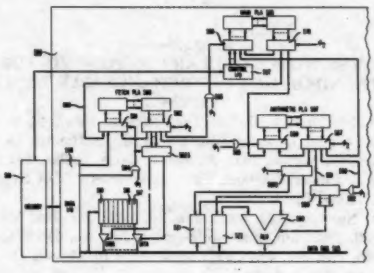
Donald E. Blahut, Holmdel; Marc L. Harrison, Morganville, and Mark E. Thierbach, Middletown, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,399,516, dated Aug. 16, 1983, Ser. No. 233,143, Feb. 10, 1981. Application for reissue Aug. 16, 1985, Ser. No. 766,912

Int. Cl.[4] G06F *9/22*

U.S. Cl. 364—716 10 Claims

1. An integrated circuit structure including a first logic array having an associated input register for supplying first signals to said first logic array, and a second logic array having an associated output register for receiving second signals from said second logic array, said input and output registers being operative respectively in [response to] first and second [phase clock pulses, clock means for applying clock pulses in said first and second phase] *clock phases* and means for applying inputs to said input register *during said first clock phases*, said structure being characterized by control means, connected between said output register and said input register *and* responsive to an output from said output register during [each] *a* second phase [clock pulse], for controlling modification of selected ones of said [second] *first* signals received in the [output] *input*



register during the next [preceding second] *first* phase [clock pulse].

Re. 32,859

ACOUSTIC SURFACE WAVE DEVICES

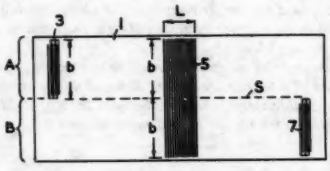
Frank G. Marshall, and Edward G. S. Paige, both of West Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Original No. 3,836,876, dated Sep. 17, 1974, Ser. No. 249,573, May 2, 1972. Application for reissue Jan. 12, 1987, Ser. No. 4,381

Claims priority, application United Kingdom, May 5, 1971, 13125/71

Int. Cl.[4] H03H *9/145, 9/25, 9/42, 9/64*

U.S. Cl. 333—151 40 Claims



1. An acoustic surface wave device which comprises *a single substrate having* at least a first track and a second track, said tracks being *located at spaced areas of said substrate each of which areas is* formed of a material able to support acoustic surface waves and having first and second piezoelectric regions respectively across both said first and second tracks, means for launching surface acoustic waves along the first track, and means for receiving and detecting acoustic surface wave energy travelling along the second track, said device further comprising acoustic surface wave coupling means *on said substrate* extending between said tracks and having a first part disposed across said first track and a second part disposed across said second track, said first and second parts of said coupling means comprising a plurality of spaced filamentary electrical conductors *all of which are electrically insulated from one another and* each of which extends in length over the first region and thence without interruption over the second region, those parts of said filamentary conductors which extend across said first region being substantially parallel to another and being oriented substantially orthogonal to the direction of energy travel along said first track, and those parts of said filamentary conductors which extend across said second region being substantially parallel to one another and being oriented substantially orthogonal to the direction of energy travel along said second track, said coupling means being

operative to transfer energy between said first and second tracks by transduction whereby energy in said first track comprising at least some of the acoustic surface wave energy traveling in the [travck] *track* is intercepted and converted into electrical energy induced between said conductors by said first part of the coupling means extending across the first track, is then transferred toward said second track along the filamentary electrical conductors of the coupling means as said electrical energy is then converted back to surface acoustic wave energy and relaunched as surface acoustic surface wave energy *traveling substantially in a single direction only* in the second track by said second part of the coupler means extending across the second track.

Re. 32,860

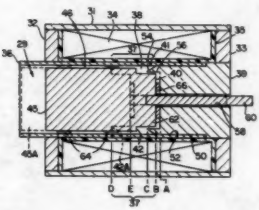
SOLENOID CONSTRUCTION AND METHOD FOR MAKING THE SAME

Bruce D. Clark, Clifton Springs, N.Y., assignor to G. W. Lisk Company, Inc., Clifton Springs, N.Y.

Original No. 4,604,600, dated Aug. 5, 1986, Ser. No. 740,640, Jun. 3, 1985. Continuation-in-part of Ser. No. 563,891, Dec. 23, 1983, Pat. No. 4,539,542. Application for reissue Jan. 4, 1988, Ser. No. 140,661

Int. Cl.[4] H01F 7/08

U.S. Cl. 335—261 **33 Claims**



1. An assembly for use in a solenoid comprising:

a. a hollow solenoid armature tube adapted to be received in a solenoid coil, said tube having an armature chamber therein;

b. a stationary pole piece member fixed in and defining one end of said armature chamber;

c. an armature member positioned in said armature chamber of said tube for axial sliding movement relative to and defining an armature stroke relative to said pole piece member;

d. one of said members having an axially extending recess therein and the other member having a reduced in cross section end portion adapted to be received in and complementary to said recess;

e. said other member having a radially internally facing frusto-conical surface formed on said reduced in cross section end portion and disposed within said recess *to face radially internally into an air gap not entered by said other member;*

f. said armature tube having a non-magnetic section defining a reduced magnetic gap extending coaxially with *said air gap and with* at least a portion of said armature stroke sufficient to permit selected magnetic forces to be produced on said armature; and

g. said armature tube providing concentricity of said two members.

Re. 32,861

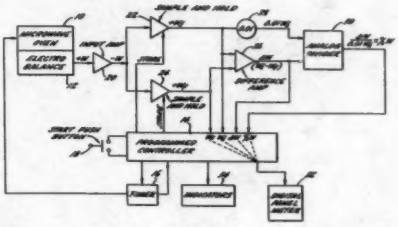
AUTOMATIC VOLATILITY COMPUTER

Michael J. Collins, Charlotte; Bernard W. Cruse, Jr., Indian Trail, and Ronald J. Goetchius, Charlotte, all of N.C., assignors to CEM Corporation, Indian Trail, N.C.

Original No. 3,909,598, dated Sep. 30, 1975, Ser. No. 381,087, Jul. 20, 1973. Application for reissue Jul. 21, 1980, Ser. No. 170,932

Int. Cl.[4] G06G 7/16

U.S. Cl. 364—567 **13 Claims**



1. An automatic volatility computer comprising automatic weighting means, microwave heating means *including an enclosed heating chamber and a microwave energy source transmittably connected therewith,* a program controller means, memory circuit means, differential amplifier means, analog divider means and information readout means, said automatic weighing means being *at least partially* positioned within said microwave heating [means] *chamber,* said controlling means being electrically connected to and programmed to sequentially actuate said weighing means and [mircrowave] *microwave* heating means, said weighing means being [electrially] *electrically* connected to said memory circuit means and hence to said differential amplifier means, said analog divider means being electrically connected to said differential amplifier means and said memory circuit means, the output thereof being electrically connected to said information readout means.

PLANT PATENTS

GRANTED FEBRUARY 7, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,581
CHRYSANTHEMUM PLANT NAMED YELLOW OVARO

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed May 15, 1987, Ser. No. 49,952
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct Chrysanthemum plant named Yellow Ovaro, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; anemone capitulum type; yellow ray floret color; diameter across face of capitulum of up to 12 cm at maturity when grown as a pinched disbudded pot mum, with diameter of anemone cushion of up to 4 cm; uniform eight week photoperiodic flowering response to short days; tall plant height when grown as a pinched pot mum; recommended both as disbudded and spray pot mum; and spreading and prolific branching pattern.

6,582
ROSE PLANT NAMED DE VORAN

Stanley G. Marciel, Pleasanton, Calif., assignor to DeVor Nurseries, Inc., Pleasanton, Calif.

Filed Jul. 7, 1987, Ser. No. 70,729
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—16 1 Claim

1. The new and distinct variety of rose plant and parts thereof, substantially as herein shown and described, characterized by the very large size of its orange-yellow blooms, which are produced continuously and profusely with sturdy, upright peduncles on a very tall plant of free branching character with vigorous, upright and strong canes, moderately abundant foliage, and very vigorous growth rate.

6,583
ROSE PLANT NAMED DEVAURORA

Stanley G. Marciel, Pleasanton, Calif., assignor to DeVor Nurseries, Inc., Pleasanton, Calif.

Filed Jul. 7, 1987, Ser. No. 70,730
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. The new and distinct variety of miniature rose plant and parts thereof, substantially as herein shown and described, characterized by its profuse and continuous production of bright orange flowers of generally small size, and by its vigorous, upright and free branching growth habit.

6,584
ROSE PLANT NAMED DE VROJO

Stanley G. Marciel, Pleasanton, Calif., assignor to DeVor Nurseries, Inc., Pleasanton, Calif.

Filed Jul. 7, 1987, Ser. No. 70,731
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. The new and distinctive variety of miniature rose plant and parts thereof, substantially as herein shown and described, characterized by its profuse and continuous production of Cardinal Red flowers of small size and having a vigorous, upright, free-branching and rapid growth rate habit.

6,585
KENTUCKY BLUEGRASS

Virgil D. Meier, Marysville, Ohio; James K. Turner, Salem, Oreg., and Eugene W. Mayer, Marysville, Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio

Filed May 29, 1987, Ser. No. 55,435
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 1 Claim

1. A variety of Kentucky bluegrass plant, substantially as shown and described, characterized by a high level of resistance to disease, especially leaf spot disease, a desirable green color throughout the growing season, a high quality persistent turf under a wide variety of environmental conditions and a very high level of seed yielding capacity.

6,586
CHRYSANTHEMUM PLANT NAMED LUCIDO

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed May 15, 1987, Ser. No. 49,951
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct Chrysanthemum plant named Lucido, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; red ray floret color; good color retention under high light conditions; diameter across face of capitulum of up to 7.5 cm at maturity when grown as a pinched spray pot mum; uniform eight week photoperiodic flowering response to short days; medium plant height when grown as a pinched pot mum; recommended as spray pot mum for all pot sizes; and spreading and prolific branching pattern.

6,587
AFRICAN VIOLET PLANT NAMED SONJA

Reinhold Holtkamp, Sr., Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 55,878
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Sonja, as described and illustrated, and particularly characterized by its violet-shaped, but round-looking purple flowers with wavy edges; upright flower stems, producing a nice bouquet above the foliage; profuse flowering; vigorous growth habit; round to oval medium green leaves; and long lasting and non-dropping flowering habit.

6,588
APPLE TREE NAMED RAFZUBIN

Walter Hauenstein, Rafz, Switzerland, assignor to Hauenstein A.G., Rafz, Switzerland

Filed Jun. 15, 1987, Ser. No. 61,671
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct apple tree named Rafzubin, as described and illustrated, and particularly characterized by its excellent flavor, high content of sugar and acidity, long and slender stalks, form and wood similar to Golden Delicious, and lamina generally similar to Golden Delicious but biserrate, small fruit during first two years of production but normal size third year of production and thereafter, and by its excellent keeping quality.

6,589
CHRYSANTHEMUM PLANT NAMED GOLDEN GEOS
Christine Jordan, Tenerife, Canary Islands, Spain, and Marie Satory, Hamburg, Fed. Rep. of Germany, assignors to Ball Pan Am Plant Co., Parrish, Fla.
Filed Jul. 7, 1987, Ser. No. 70,728
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinctive cultivar of Chrysanthemum named Golden Geos, as illustrated and described.

6,590
CHRYSANTHEMUM PLANT NAMED ANTONIO
Dieter Sueptitz, Hamburg, Fed. Rep. of Germany, assignor to Ball Pan Am Plant Co., Parrish, Fla.
Filed Jul. 16, 1987, Ser. No. 74,481
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Antonio, as illustrated and described, and particularly characterized by its clear white ray floret color, with immature lime green to mature yellow disc florets; flat capitulum form and single capitulum type; nine week response, and its compact growth habit.

6,591
CHRYSANTHEMUM PLANT NAMED GOLDEN ANTONIO
Dieter Sueptitz, Hamburg, Fed. Rep. of Germany, assignor to Ball Pan Am Plant Co., Parrish, Fla.
Filed Jul. 16, 1987, Ser. No. 74,482
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Golden Antonio, as illustrated and described, and particularly characterized by its yellow-gold flower color, daisy form, nine week response, free breaking habit, and its good performance in year round pot mum programs.

6,592
POINSETTIA NAMED SUPJIBI
Eduard Gross, 16250 Blanzac, Nanteuillet, France
Filed Apr. 1, 1987, Ser. No. 32,831
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—86 1 Claim

1. A new and distinct poinsettia cultivar, substantially as herein shown and described, particularly distinguished by large, bright red bracts, large thick stems and leaves and a self-branching growth habit.

6,593
VARIETY OF GERANIUM NAMED MANDARIN
Blair L. Winner, Lompoc, Calif., assignor to Denholm Seeds, Lompoc, Calif.
Filed Jul. 15, 1987, Ser. No. 73,807
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of geranium plant substantially as herein shown and described and parts thereof.

6,594
MAPLE TREE NAMED MARELTOI
Herman H. Haver, 10411 N. 84th St., Omaha, Nebr. 68122
Filed Jan. 12, 1987, Ser. No. 2,792
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variewty of maple tree of the species botanically known as *Acer saccharinum*, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of slow growth, harder wood, split lacy leaf, appearing seedless, very hardy, and resistant to blight and insects.

6,595
BEDDING VIOLA NAMED 'BLACK MAGIC'
Jackson P. Muldoon, 29370 Mill Creek Rd., Sheridan, Oreg. 97378
Filed Aug. 6, 1987, Ser. No. 82,296
Int. Cl.[4] H01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct form of Viola plant as described and illustrated known by the cultivar name Black Magic and particularly characterized by its black flowers; floriferous habit; low growing, compact and spreading form; ability to thrive heartily in full sun and its hardiness to severely cold Winter temperatures.

6,596
ROSE PLANT
J. Benjamin Williams, 2800 Elnora St., Silver Spring, Md. 20902
Filed Jul. 17, 1987, Ser. No. 75,000
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—4 1 Claim

1. A new and distinct variety of rose plant of the climber class, substantially as herein shown and described, characterized particularly as to novelty by its vigorous habit of growth, its good hardiness, its abundant and attractive foliage, its very good remontance, its habit of producing excellent formed blooms singly on long-stemmed canes and in clusters, the strong and appealing fragrance of its blooms, and the general color tonality of the flowers is bright orange-red, with dark velvet overtones on the inner petals of the open flower.

PATENTS

GRANTED FEB. 7, 1989

ERRATA

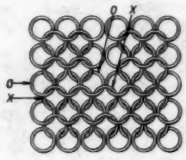
For CLASS	See PATENT NO.
425-135	4,802,267
087-008	4,802,398
164-440	4,802,436
128-661	4,802,458
182-204	4,802,471
119-029	4,802,482
198-345	4,802,565
414-790	4,802,570
241-030	4,802,635
180-219	4,802,682
402-001	4,802,789
400-660	4,802,795
401-122	4,802,797
416-241	4,802,828
273-094	4,802,880
252-049	4,802,893
427-003	4,802,924
427-433	4,802,932
055-302	4,802,983
266-078	4,803,037
252-135	4,803,058
204-192	4,803,130
525-477	4,803,254
525-420	4,803,256
514-332	4,803,277
514-431	4,803,286
514-464	4,803,290
360-122	4,803,338
341-154	4,803,461
341-172	4,803,462
341-023	4,803,463
357-081	4,803,502
323-284	4,803,612

PATENTS

GRANTED FEBRUARY 7, 1989

GENERAL AND MECHANICAL

4,802,242
GARMENT OF CHAIN ARMOUR STRUCTURE
Pehr Lars-Jos, Box 6, S-78 200 Malung, Sweden
Continuation of Ser. No. 21,592, Mar. 2, 1987, abandoned, Continuation-in-part of Ser. No. 780,653, Sep. 26, 1985, abandoned. This application Nov. 24, 1987, Ser. No. 124,907
Claims priority, application Norway, Sep. 28, 1984, 843936
Int. Cl.[4] A41D *13/00, 19/00*
U.S. Cl. 2—2 **4 Claims**



1. In a garment comprising at least two pieces of chain armour at least for two, bending parts of a body, one body part having skin which stretches when the one body part is bent and the other body part having skin which is subjected to compression when the other body part is bent, the improvement comprising:

at least two pieces of four-ring chain armour, the four-ring chain armour consisting essentially of rings which pass through and over two adjacent rings and through and under two, other adjacent rings for defining a longitudinal direction of each piece of the four-ring chain armour along ridges formed by successive ones of the rings passing over the two adjacent rings, whereby each piece of the four-ring chain armour stretches more in the longtitudinal direction than in the direction transverse thereto; and

garment-making means for making a garment at least for two, bending parts of a body, one body part having skin which stretches when the one body part is bent and the other body part having skin which is subjected to compression when the other body part is bent, the garment comprising the two pieces of four-ring chain armour with the longitudinal direction of one of the pieces 90° to the longitudinal direction of the other of the pieces, whereby the one piece may be made into a portion of the garment at the one, bendable body part with the longitudinal direction thereof in the direction the skin stretches and the other piece may be made into a portion of the garment at the other, bendable body part.

4,802,243
ACOUSTIC HEADGEAR-SUN VISOR ASSEMBLY
John W. Griffiths, 3940 NW. Echo Ct., Portland, Oreg. 97229
Filed Oct. 26, 1987, Ser. No. 112,556
Int. Cl.[4] A42B *1/24*
U.S. Cl. 2—6 **3 Claims**

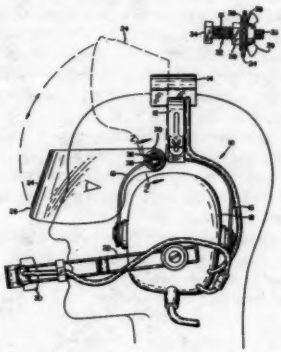
1. The acoustic headgear-sun visor assembly comprising in combination:

(a) an acoustic headpiece configured to extend laterally over a head and including a flat band support member at each side of the headpiece,

(b) a pair of split bolts each having a bifurcated, externally threaded shank receiving the flat band support member in the slot between the bifurcations,

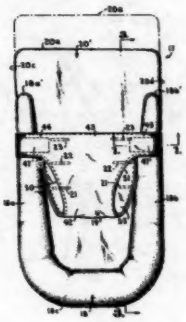
(c) a nut threaded on said bifurcated shank releasably securing said flat band support member between said nut and the base of said slot,

(d) sun visor means, and



(e) mounting means mounting the sun visor means on the split bolt.

4,802,244
PREMATURE INFANT BEDDING CONSTRUCTION
Melissa McGrath-Saleh, 1219 Amesbury, Liberty, Mo. 64068
Filed Aug. 28, 1987, Ser. No. 90,518
Int. Cl.[4] A41B *13/06*; A47G *9/00*
U.S. Cl. 2—69 **19 Claims**



1. A therapeutic positioning device for receiving and holding prematurely born infants thereon comprising, in combination:

(1) an elongate, flat base pad of substantially rectangular shape having a generally relatively upwardly positioned head end thereof and a generally relatively downwardly positioned foot end thereof, said pad ends connected by substantially straight and substantially parallel elongate side edges, said pad also having top and bottom, normally flat surfaces thereof,

(2) an upstanding, resilient yet shape retaining wall positioned at and fixed to a portion of the periphery of said pad, such pad periphery portion including the entire foot end thereof and substantial lengths of the elongate side edges of said base pad, said lengths each extending from the foot end of the base pad, such wall extending up-

wardly above said pad top surface from said foot end thereof at least partially along the side edges thereof at the substantial periphery thereof whereby a substantial portion of the central area of said pad top surface from the foot end thereof upwardly towards the head end thereof is bounded by said wall at the peripheral edges thereof;

(3) a loin-cloth like harness adapted to receive the diapered fundament of a prematurely born infant therewithin, said harness having an upper side, such comprising a substantially V-shaped first panel and a lower side, such also comprising a substantially V shaped second panel, said panels connected together at their lesser width ends by a substantially rectangular child's perineal or crotch area underlying cloth;

(4) first means for removably fixing portions of the lower side panel of the harness to the base pad and separate, second means for removably fixing portions of the upper side panel of said harness to side portions of side lengths of said upstanding wall, and

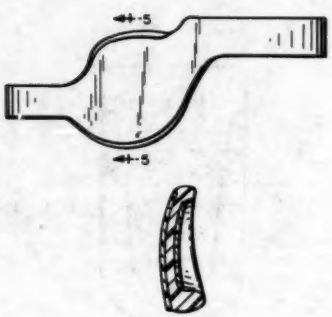
(5) said harness having both the upper and lower side panels thereof separately longitudinally adjustable and removably fixable with respect to portions of the upstanding wall and base pad, respectively.

4,802,245

EAR PROTECTOR

Richard J. Miano, 1860 Alamoana Blvd. Suite 1202, Honolulu, Hi.

Filed Sep. 19, 1986, Ser. No. 909,910
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—209 **3 Claims**



1. An ear protector for use by a swimmer, comprising:

a. a first band of dimensions which fit comfortably across a user's forehead;

b. for each ear, an ear-covering member depending downwardly from said band;

c. a second band linking the ear-covering members, such second band attaching to each ear-covering member proximate the portion thereof which covers the bottom of the user's ear and dimensioned to fit comfortably across the back of the user's head; and

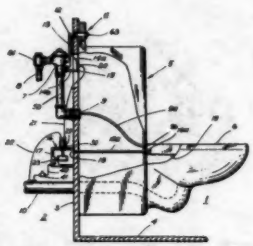
d. a resilient rim secured to the interior of each ear-covering member, said rim being large enough to encircle the user's ear and deep enough to form a seal between the ear-covering member and the user's head.

4,802,246

DISABLER AND ACTIVATION SYSTEM FOR PLUMBING FIXTURE

Martin J. Laverty, Jr., Earlyville, Va., assignor to Coyne & Delany Co., Charlottesville, Va.

Continuation of Ser. No. 781,944, Sep. 30, 1985, Pat. No. 4,709,427. This application Feb. 25, 1987, Ser. No. 18,495
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—427 **19 Claims**



1. In a liquid flush valve operating arrangement for a fixture to be flushed, including:

a flush valve operatively associated with said fixture;

a flush valve actuator assembly associated with said flush valve;

a remotely controlled operated electrically responsive unit remote from said flush valve actuator assembly and operatively associated therewith;

a pair of tubes extending between said flush valve actuator assembly and said remotely controlled operated unit;

a third tube under liquid supply line pressure connected between said flush valve and said remotely controlled operated unit, means in said remotely controlled operated unit for connecting the liquid supply line pressure from said third tube with said pair of tubes for actuating said actuator assembly;

an electrically opeaated infra-red sensor actuating device coupled with said remotely controlled operated unit for activation thereof in response to an object returning infra-red rays transmitted from said infra-red sensor actuating device to said sensor actuating device for connecting said remote operated unit with the inlet supply side of said flush valve;

said infra-red sensor actuating device comprising an infra-red radiation transmitter and an infra-red radiation receiver;

isolation means isolating said remotely controlled operating unit from said infra-red radiation transmitter and receiver;

said pair of tubes being normally at zero line pressure and being subjected to said liquid supply line pressure in response to said sensor actuating device being activated for rendering said flush valve actuator assembly operative to operate said flush valve;

means separate from said flush valve actuator assembly and associated therewith for bleeding off liquid supply line pressure to disable said remote operated unit; and

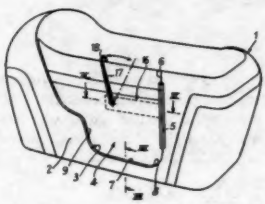
means separate from said flush valve actuator assembly and said last-mentioned means and associated with said remotely controlled operated unit for disabling thereof to render said flush valve inoprative responsive to a change in electrical energy supplied to said sensor device or said remotely controlled electrically responsive unit.

4,802,247

DOOR BATH TUBE FOR THE HANDICAPPED

Roland G. Leichle, 1, chemin du Baron, Cirey sur Vezouze, France (54480), and Jean-Paul Lecrivain, 9, Allée Belle Vue, Luneville Chanteheux, France (54300)

Continuation of Ser. No. 694,516, filed as PCT FR84/00090 on April 3, 1984, published as WO84/04236 on Nov. 8, 1984, abandoned. This application Aug. 8, 1986, Ser. No. 894,093
This application Aug. 8, 1986, Ser. No. 894,093
Claims priority, application France, Apr. 28, 1983, 83 07027
Int. Cl.[4] A47K 3/02
U.S. Cl. 4—556 15 Claims



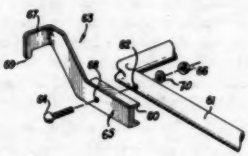
1. A bath-tub with a door for motive disabled persons, which includes a side door (4) adapted for being opened outwardly by tilting about an articulation (5) of vertical axis for clearing a cut-out part or access bay into the bath-tub, is characterized by the fact that the width of the cut-out part (3), measured horizontally, increases continously from the bottom to the top, that the contour of the cut-out part (3) on the wall of the bath-tub body (1) has a rabbet (10) turned inwardly to the bath-tub, that the cooperating contour of door (4) has a complementary rabbet (11) turned outwardly from the bath-tub, a seal (12) being provided between the two rabbets, and in that the door is provided with an operating handle (17) and with a mechanism (16) adapted, under the action of the operating handle, for lifting the door from its lower closed position for vertically disengaging the two rabbets from each other at least in their region which are remote from the articulation and allowing the free opening pivoting movement of the door outwardly.

4,802,248

CRIB SPRING HANGER ASSEMBLY

John W. Moroney, Glendora, and Jugal K. Ralli, Los Angeles, both of Calif., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Mar. 5, 1986, Ser. No. 836,370
Int. Cl.[4] A47C 31/00, 19/00
U.S. Cl. 5—11 2 Claims



1. Apparatus for hanging a spring frame from a crib comprising

at least one closed loop bracket support mounted at each corner of a crib;

a removable hanger for mating with and being supported by each of said bracket supports, each of said hangers comprising

a rigid plate having two ends, one end of said plate being of a dimension to pass through and rest upon its associated closed loop bracket support whereby said bracket support supports said rigid plate;

a downwardly extending lip at the one end of said plate, said lip extending beyond and below said closed loop bracket support when said plate rests upon said bracket support;

a C-channel secured to the other end of said plate for mating with a spring frame;

mating boreholes through said plate, said C-channel and said spring frame; and

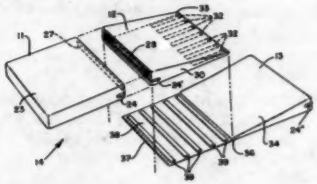
a bolt for passing through said boreholes.

4,802,249

PORTABLE MULTIPLE SECTION ADJUSTABLE POSTURE CONTOUR CARE BED

Earl C. Bills, P.O. Box 365, Savoy, Tex. 75479

Filed Feb. 19, 1988, Ser. No. 157,590
Int. Cl.[4] A47C 20/00, 27/00
U.S. Cl. 5—420 10 Claims



1. A multiple section adjustable posture contour care bed comprising: a plurality of cushions including two wedge shaped cushions each rectangular in plan view and wedge shaped in side edge view extending from a wide end to a thin edge; extension flap means having a top face extending from the thin edge of a first cushion of said two wedge shaped cushions for a length approximately the length of one of said wedge shaped cushions; an area contact interlocking material positioned on the top face of said extension flap means; and a second contact interlocking material that position locks on contact with said contact interlocking material on the top face of said extension flap means with said second contact interlocking material mounted on the bottom of the second cushion of said two wedge shaped cushions extending from the thin edge of the cushion back for a distance under the cushion to facilitate placement of the second cushion at various spacings from the first cushion in adapting to the height of a user; and wherein a third cushion is included in said plurality of cushions that is generally of rectangular shape both plan view wise and side end view wise, and that has rectangular forward and rear faces; and fastening means on the forward face of said third cushion engageable in interlocking relation with fastening means positioned on the wide end of one of said wedge shaped cushions.

4,802,250

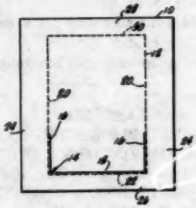
SELF-ALIGNMENT BEDDING

Richard S. Farr, 2257 Century Hill, Los Angeles, Calif. 90067

Continuation-in-part of Ser. No. 725,649, Apr. 22, 1985, abandoned. This application Jun. 5, 1987, Ser. No. 58,912
Int. Cl.[4] A47G 9/00
U.S. Cl. 5—482 5 Claims

1. A bedding having a central longitudinal axis adapted for use on and alignment with foot and sides of a rectangular mattress having a central longitudinal axis to facilitate making of a bed, said bedding comprising a flat substantially rectangular sheet of material defining a foot end, a head end and a plurality of mattress alignment indicators disposed on said sheet adjacent said foot end thereof, said indicators including a first transverse mattress foot alignment indicator and a mattress centering indicator, said foot alignment indicator being spaced inwardly from and extending parallel to said foot end of said bedding such that upon said bedding being positioned on

said mattress for securement thereto, said foot alignment indicator is disposed over and extends parallel to the foot of the mattress and said centering indicator is disposed over a portion



of said mattress so as to superimpose the central longitudinal axis of said bedding over the central longitudinal axis of the mattress.

4,802,251

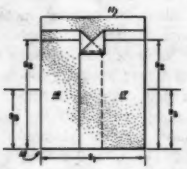
TOP AND BOTTOM BED-SHEETING COMBINATION

Mark A. O'Dell, 731 S. Whiting Clr., Mesa, Ariz. 85204

Filed Dec. 17, 1987, Ser. No. 134,258

Int. Cl.[4] A47C *23/00*

U.S. Cl. 5—502 **6 Claims**



1. Bed sheeting for use with a bed having a mattress on which a bottom sheet may be fittingly emplaced, said sheeting comprising:

a bottom sheet to removably encompass a mattress and having four perimeter sides including a head side and a foot side, a left and a right side; and,

a top sheet comprising two sheeting sections coupled to said bottom sheet along the bottom side thereof such that a first one of said two sheeting sections covers more than a first half of the top surface of said bottom sheet, a second one of said two sheeting sections covers more than a second half of the top surface of said bottom sheet, and each of said first and said second ones of said two sheeting sections overlap in a region central to the top surface of said bottom sheet.

4,802,252

BEDCLOTHING SUPPORT

Adrian Marmor, 300 Millbank Rd., Bryn Mawr, Pa. 19010

Filed Apr. 29, 1987, Ser. No. 43,951

Int. Cl.[4] A47C *21/02*

U.S. Cl. 5—505 **3 Claims**

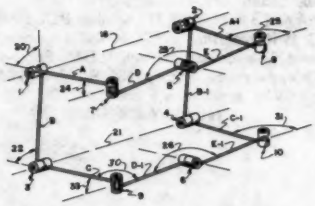
1. For a bed having a mattress supported on a spring, a unitary device for elevating a portion of bed clothing above the level of the mattress comprising:

a base portion for insertion between the mattress and the spring;

a support portion to extend over the mattress and support the bed covering;

a connector portion between the base portion and the support portion; and

said portions being comprised of interconnected pivot means and post means which provide for the base portion, the connector portion, and the support portion to be oriented with respect to one another for the base portion to be inserted between the mattress and the spring and for the



support portion to extend over the mattress and also providing for the base portion, the connector portion, and the support portion to be oriented with respect to one another to assume a substantially planar condition for storage.

4,802,253

DRY CLEANING METHOD USING AT LEAST TWO KINDS OF SOLVENTS

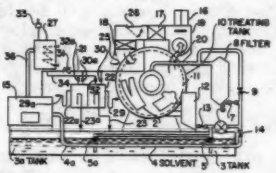
Haruo Hagiwara; Hideo Tsukamoto, and Yasuhiro Tsubaki, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 14,655, Feb. 13, 1987, which is a division of Ser. No. 813,698, Dec. 27, 1985, Pat. No. 4,712,392. This Claims priority, application Japan, Dec. 28, 1984, 59-277497; Dec. 28, 1984, 59-277498

application Aug. 25, 1987, Ser. No. 89,122

Int. Cl.[4] D06F *43/08*

U.S. Cl. 8—158 **1 Claim**



1. A dry cleaning method comprising the steps of providing tanks for exclusively receiving at least two kinds of solvents which are soluble in each other, connecting one treating tank to the tanks, providing a fractionating device, connected to the tanks and the treating tank, recovering the two or more kinds of solvents by fractional distillation through the use of the fractionating device, providing exclusive filters for the respective solvents through the use of a common filter or a multi-filter device composed of both the filters which is disposed between the tanks and the treating tank, and using the two or more kinds of solvents independently so that washing is carried out.

4,802,254

ANTI-CORD SWALLOWING SYSTEM AND METHOD FOR A FLOOR CLEANER

Kendell S. Lahndorff, Harrodsburg, and Wilbur C. Bewley, Jr., Lexington, both of Ky., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 2, 1988, Ser. No. 188,845

Int. Cl.[4] A47L *9/00*

U.S. Cl. 15—41 R **19 Claims**

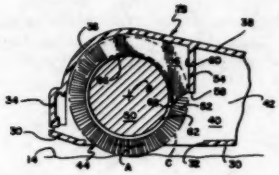
1. A floor cleaner comprising

a rotatable beater brush having a dowel,

a housing having an upper wall,

an elongate power cord and

means for preventing said cord from wrapping around said beater brush, said preventing means including a plurality of grooves formed about the periphery of said dowel and spaced apart along the length of said dowel and



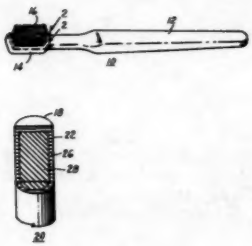
a plurality of spaced apart ribs each extending from a surface of said housing and about a circumferential portion of said beater brush, each of said ribs extending partially into one of said grooves.

4,802,255

NOVEL BRUSH FILAMENTS

Miklos M. Breuer, Newton, and Joseph A. Hanak, Norwell, both of Mass., assignors to Gillette Canada Inc., Montreal, Canada

Filed Aug. 10, 1987, Ser. No. 83,336
Int. Cl.[4] A46B 9/04
U.S. Cl. 15—159 A **18 Claims**



1. A monofilament for a toothbrush, said filament having a longitudinal surface defining the maximum width (W) of the cross-sectional area of the filament which includes a first colored region provided by a dye colorant and which extends along at least a portion of the longitudinal surface, said first colored region being arranged in association with another portion of the cross-sectional area providing at least one different colored region, said first colored region providing a color intensity which can change in response to increased use of the filament to provide a signal indicative of wear.

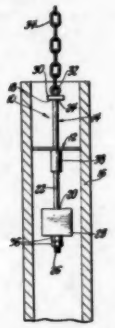
4,802,256

SLIDE HAMMER CHIMNEY CLEANER

Marvin W. Usimaki, Rte. 1, Box 186, Pelke, Mich. 49958

Filed Sep. 8, 1987, Ser. No. 94,140
Int. Cl.[4] F23J 3/00
U.S. Cl. 15—243 **8 Claims**

1. An apparatus (10) for cleaning debris from the inner surfaces of a chimney comprising; a scraping plate (12) having a periphery for completely conforming to the cross-sectional shape of the inside flue (16) of a chimney, and a support means (14) for supporting said scraping plate (12) in a transverse orientation relative to the longitudinal axis of the chimney flue (16) while moving said scraping plate (12) through the chimney flue (16), said apparatus (10) characterized by said scraping plate (12) being inflexible and said periphery thereof contacting the entire inside surface of the chimney flue (16) for unyielding scraping the entire inside surface of the chimney flue (16) during movement therethrough and being slidable along said support means (14) between a first striking surface (18) and a longitudinally spaced second striking surface (20), said support means (14) including an elongated shaft (22) disposed perpendicularly and centrally through said scraping plate (12), and said scraping plate (12) including a sleeve member (38) fixedly attached thereto for supporting said scraping plate (12) on said shaft (22) in a perpendicular orientation relative to the longitudinal axis of said shaft (22).

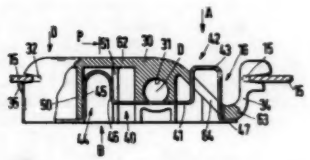


4,802,257

WIPER BLADE FOR CLEANING WINDOW PANES OF MOTOR VEHICLES

Reinhard Edele, Bietigheim-Bissingen, and Eckhardt Schmid, Brackenheim, both of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

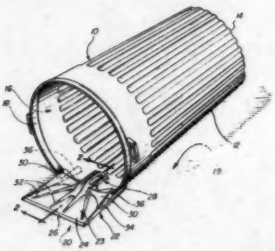
Filed Jul. 16, 1987, Ser. No. 74,002
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1986, 3625063
Int. Cl.[4] B60S 1/40
U.S. Cl. 15—250.32 **15 Claims**



1. A wiper blade, comprising a supporting yoke having a substantially U-shaped cross-section formed by two side walls and a connecting web, an aperture in said web, in the area of said aperture said side walls being provided with coaxially aligned bores for receiving an insertable pin for articulating a wiper arm, a component part fixed between the side walls for axially securing the position of the pivot pin, said component part having a bearing bore which is coaxially aligned with said first mentioned bores, the diameter of said first mentioned bores being substantially larger than the diameter of the pivot pin to be received therein whereby there is no contact between the pivot pin and the walls of said first mentioned bores a metallic locking spring being fixed in the component part which intersects the bearing bore for cooperation with a groove in the pivot pin, the portion of said locking spring which contacts the pivot pin being essentially flat and having

similar width as said groove in the pivot pin so that the pivot pin is axially secured.

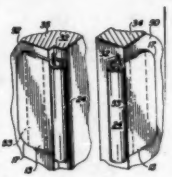
4,802,258
COMBINATION DUSTPAN AND GUIDE MEANS FOR FILLING TRASH CONTAINERS AND THE LIKE
Otto S. Jensen, 5650 Panorama Dr., Whittier, Calif. 90601
Filed Mar. 18, 1987, Ser. No. 27,257
Int. Cl.[4] A47L *13/52*
U.S. Cl. 15—257.1 5 Claims



1. A combination dustpan and guide for filling trash containers, comprising:
a main body member having a scoop portion formed therein;
stabilizing means formed as part of said main body whereby said dustpan, when attached to a trash container, prevents said trash container from rolling when placed in a horizontal position;
said stabilizing means comprising a pair of depending flange members formed longitudinally along each side of said dustpan;
said flange members extending rearwardly of said scoop portion, forming a pair of oppositely disposed leg members so as to be positioned under said trash container when said trash container is laid in a horizontal position;
attaching means formed rearwardly of said scoop portion, whereby said dustpan is removably attached to said trash container;
said attaching means including a handle and said leg members, said handle is inserted into said trash container;
at least one depending tooth-like member extending downwardly from said handle for gripping engagement with the inner surface of said container wall;
each of said leg members being formed with an enlarged rear lobe portion, said lobe portions engage the outer surface of said container wall said trash container being gripped between said tooth-like member and said lobe portions; and
guide means formed in said scoop portion to guide and direct debris directly into said container when said debris is swept into and over said dustpan.

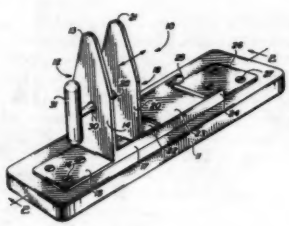
4,802,259
SPATTER SHIELD
Daniel G. Geslewitz, 8014 E. Del Tesoro, Scottsdale, Ariz. 85261
Filed Mar. 20, 1987, Ser. No. 28,216
Int. Cl.[4] E05D *11/00*
U.S. Cl. 16—251 6 Claims

1. A shield for use in combination with a hinge component, said hinge component including
a leaf having an exposed surface and an edge with a defined contour, and
a generally cylindrical pintle portion projecting from said surface,
said leaf being affixed to an environmental structure having a surrounding surface,
and for protecting said hinge component during application of a treatment to said surrounding surface, said sheild comprising:
(a) a cover for overlaying the exposed surface of said leaf, said cover including a generally rigid panel having a surface for lying in juxtaposition with the exposed surface of said leaf and an edge of said leaf;
(b) attachment means for detachably securing said cover to said hinge component, said attachment means comprising a generally tubular member extending along a



portion of the edge of said panel and having a bore for receiving said pintle portion therein; and
(c) a short tab extending generally radially from said tubular member in the same direction as the panel and at an acute angle to said panel for bearing against said environmental member and urging potential rotational movement of said tubular member about said pintle portion to urge the surface of said panel against the exposed surface of said leaf.

4,802,260
CRAB OPENER APPARATUS
Justin Fletcher, 1216 Carolina Ave., Lynn Haven, Fla. 32444
Filed Sep. 14, 1988, Ser. No. 244,094
Int. Cl.[4] A22C *29/04*
U.S. Cl. 17—76 9 Claims

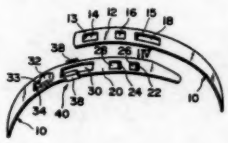


1. A crab opener comprising:
a base;
a fixed blade fixedly attached to said base, said fixed blade having an aperture therein;
a slidable blade extending generally parallel to said fixed blade and slidably mounted to said base, said slidable between a first position adjacent said fixed blade and a second position separated from said fixed blade;
a rod connected to said slidable blade and extending through said aperture in said fixed blade; and
a handle attached to said rod for moving said rod and slidable blade between first and second positions when a crab is positioned on adjacent fixed and slidable blades.

4,802,261
CLAMP BAND

Yasumasa Mizukoshi, Fujisawa, and Minoru Ishijima, Maebashi, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 918,135
Claims priority, application Japan, Jan. 16, 1986, 61-5137
Int. Cl.[4] B65D 63/02
U.S. Cl. 24—20 TT 16 Claims



1. A clamp band adapted to be formed into a loop-like shape around a cylindrical member with a first end porion of the band overlapping a second end portion of the band to the outside of the second end portion, characterized in that:

said first end portion has an inwardly directed first projection formed adjacent to a first aperture lengthwise of the band, and a rectangular second aperture which has a tool-engaging end edge and which is formed closer to a fore end of said first end portion than is said first projection,

said second end portion has an outwardly directed second projection formed adjacent to a third aperture lengthwise of the band, and a protuberance which has a tool-engaging end edge adjacent to a rectangular fourth aperture lengthwise of the band and which is further than said second projection from the fore end of said second end portion,

said tool-engaging end edges, said first and second projections, and said first and third apertures are disposed such that with the first and second end portions of the band partially overlapped, oppositely directed tangential clamping forces may be applied to said tool-engaging end edges by respective portions of a clamping tool to increase the amount of overlap of said end portions and thereby bring the band into a clamped state in which said first projection is received in said third aperture and said second projection is received in said first aperture, with a back part of said first projection engaging a back part of said second projection and the engaged projections supporting circumferential forces that would tend to separate the overlapped end portions of the band, and

retaining means is provided for retaining said first end portion adjacent said second end portion to prevent said first end portion from drifting outward from said second end portion when the band is in said clamped state.

4,802,262
BUCKLE ASSEMBLY

Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 10, 1987, Ser. No. 83,462
Claims priority, application Japan, Aug. 12, 1986, 61-123530[U]
Int. Cl.[4] A44B 11/25
U.S. Cl. 24—606 14 Claims

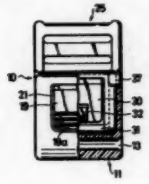
1. A buckle assembly comprising:

(a) a plug member molded of synthetic resin and including a resilient tongue having a locking lug disposed thereon; and

(b) one-piece socket member molded of synthetic resin and adapted to be releasably coupled with said plug member, said one-piece molded socket member including

(i) a pair of spaced upper and lower wings joined together by a pair of opposed side walls so as to define therebetween a guide channel for receiving therein said resilient tongue, said upper wing having a cut-away groove communicating with said guide channel to form a cantilevered resilient flap, said resilient flap having a releasing lug projecting into said guide channel, and

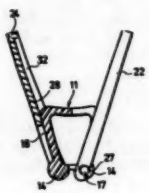
(ii) a stopper bar extending between said side walls transversely across said guide channel and being spaced a distance from said releasing lug in a direction toward an inlet of said guide channel, said stopper bar being lockingly engageable with said locking lug to couple said plug and socket members, said releasing lug being engageable with said locking lug to urge the latter out of locking engagement with said stopper bar when said resilient flap is flexed toward said lower wing, and said stopper bar being engageable with said resilient flap to limit inwardly flexing movement of said resilient flap to such an extent that said resilient tongue of said plug member is prevented from being jammed against an inner surface of said lower wing of said socket member.



4,802,263
DEVICE FOR CLIPPING PAPER

Kurt Lorber, Schurwaldstrasse 114, D-7307 Aichwald 2, Fed. Rep. of Germany

Filed Jul. 2, 1987, Ser. No. 69,424
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1986, 3623766
Int. Cl.[4] B42F 1/02
U.S. Cl. 24—67.5 11 Claims

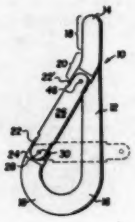


1. A device for detachably clipping sheets and the like, comprising:

a clip constructed as a cross-sectionally roughly U-shaped profile, the profile having sides terminating in leg ends defining two longitudinal edges of the clip, the clip being resiliently biased to bring said longitudinal edges toward one another, the longitudinal edges having integrally molded pins extending in opposite directs from front ends of the longitudinal edges; and,

two levers operable for spreading apart the longitudinal edges of the clip, the levers having lateral slits engagable on the pins by snapping the levers onto the pins in a push-button-like manner, and the levers being articulated to the clip at said pins at the front ends of the longitudinal edges, the levers being engaged against the sides of the clip to spread said longitudinal edges, the clip and the levers being molded plastic.

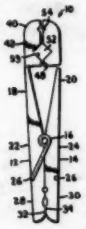
4,802,264
TWISTED CARABINER
Kyle Isenhart, Rte. 2, Box RS1, Little Hocking, Ohio 45742
Filed Dec. 8, 1987, Ser. No. 130,030
Int. Cl.[4] A44B 13/00
U.S. Cl. 24—241 P 6 Claims



6. A carabiner comprising
a unitary body including
a substantially straight back portion having a longitudinal axis,
a pair of curved end portions extending from opposite ends of the back portion, each of said end portions comprising a proximal segment lying in a respective plane, the planes of the opposite proximal segments being substantially perpendicular to one another, and a distal segment bent out of the plane of its adjacent proximal segment and terminating at a tip substantially aligned with the tip of the opposite end portion along an axis that is skewed relative to the axis of the back portion,
a gate hinged to a first one of said tips, so as to be movable between open and closed positions, and having means for engaging the second of said tips, to form a closed loop, and
means for biasing said gate away from its half-open position, toward either its fully open or its fully closed position,
wherein said gate has an axial blind bore closed at its free end, and wherein said biasing means comprises a compression spring bottomed in said bore and a pawl in engagement with said spring and protruding from said bore, said pawl bearing against said first tip, and
wherein said first tip has a notch therein for receiving said pawl, said notch being positioned so as to bias said gate away from its half-open position.

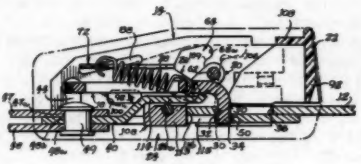
4,802,265
REMOVABLE SKIRT AND TROUSER CLIP FOR GARMENT HANGER
Robert L. Stevenson, 7320 W. 87th St., Overland Park, Kans. 66212
Filed Oct. 1, 1987, Ser. No. 103,803
Int. Cl.[4] A41D 27/22; A47G 25/48
U.S. Cl. 24—335 1 Claim

1. An attachment for a garment hanger having a horizontal cross bar and comprising:
(a) a single pair of rigid, elongate fingers with a single spring coil mounted medially and positioning said fingers in a pinching relationship;
(b) jaw portions at respective first ends of each of said fingers and urged into pinching contact by said spring coil for retaining an article of clothing therebetween;
(c) said fingers being spaced apart at respective second ends with one of said fingers including an extension portion projecting linearly outwardly;
(d) an opposing block member positioning against said extension portion and separate from the other of said fingers, said block member being detachably connected to said extension portion by a screw and nut assembly;
(e) said extension portion and said block member having opposing faces with a plurality of triangular shaped recesses of correspondingly graduated sizes located at intermediate positions and forming a diamond shaped aperture when said recesses are mated for receiving and clamping



about said crossbar whereby said attachment is securely suspended from said cross bar and maintains a garment in hanging relation to said garment hanger.

4,802,266
SEAT BELT BUCKLE
Gerald A. Doty, Crown Point, Ind., and James L. Zygutis, Frankfort, Ill., assignors to Gateway Industries, Inc., Olympia Fields, Ill.
Filed May 1, 1987, Ser. No. 45,954
Int. Cl.[4] A44B 11/28
U.S. Cl. 24—637 7 Claims



1. A seat belt buckle comprising:
a tongue plate;
a cover;
a buckle frame disposed within the cover and having a pair of upstanding parallel sidewalls and an opening at its forward end for receiving the tongue plate;
pivotal latching means movable between a latching position for retaining the tongue plate within the buckle frame and an open position for enabling the tongue plate to travel into and out of the buckle frame;
locking means for locking the latching means in latching position including a movable transverse member extending across the width of the buckle adjacent the latching means and detent means defining a locked position and an unlocked position for the transverse member;
a push button movable between a first position and a second position and operatively associated with the latching means for shifting the latching means from the latching position to the open position when the push button is moved from the first position to the second position;
ejection means including a generally cylindrical ejection pin extending transversely across the width of the buckle for urging the leading end of the tongue plate away from said buckle frame;
actuating means operatively associating the ejection pin with the transverse member to shift the latching means into latching position upon insertion of the tongue plate;
biasing means to bias the transverse member toward the unlocked position when the latching means is in the open position and to urge the transverse member into the locked position when the tongue plate is pushed into the

buckle frame and the latching means is moved into the latching position, said biasing means including a single coil spring loaded in tension, said spring having forward and rearward ends, the spring being attached at its forward end to the latching means to urge the latching means toward the open position; and

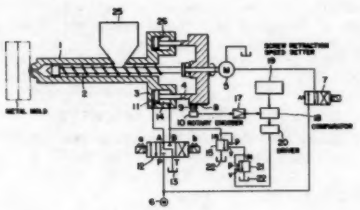
said actuating means including a stirrup-shaped linkage member disposed within the buckle frame sidewalls so as to be protected thereby, said linkage member having a generally cylindrical central portion comprising said ejection pin, and two arms, one at each end of said ejection pin, said transverse member also extending between said two arms so as to be spaced from said ejection pin, and pivot connecting means on said two arms intermediate said transverse member and said ejection pin, said actuating means further comprising a generally U-shaped retainer member disposed within the buckle frame sidewalls so as to be protected thereby, including a bight portion extending between two legs, said legs of the U pivotally attached to said pivot connecting means, and said retainer members including a pair of opposed mounting ears attached to said bight portion, one adjacent each leg, for mounting to said frame sidewalls for pivotal and sliding movement of the retainer member relative thereto, and spring engaging means for engaging the rearward end of said spring.

4,802,267

METHOD AND APPARATUS FOR CONTROLLING RETRACTING SPEEDS OF INJECTION MOLDING MACHINES

Toshio Hosoya, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 140,143
Claims priority, application Japan, Jan. 7, 1987, 62-1220
Int. Cl.[4] B29C *45/82*
U.S. Cl. 425—135 **1 Claim**



1. Apparatus for controlling a charging speed of injection molding machine wherein a molten resin contained in a heated barrel is injected into a metal mold, said apparatus comprising:

a screw contained in said heated barrel;

means for rotating said screw;

piston-cylinder means for reciprocating said screw in said heated barrel;

pressurized oil transfer valve means for admitting and discharging pressurized oil into and from said cylinder;

means operated by said piston for generating a signal representing a screw retraction speed;

means for setting a reference screw retraction speed; and

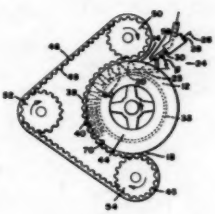
means responsive to a difference between said signal representing the screw retraction speed and said reference screw retraction speed for controlling a back pressure of said pressurized oil acting upon a rear surface of said piston, said means comprising a back pressure setting relief valve connected between a chamber in said cylinder on a back side of said piston and a drain, said back pressure setting relief valve having a pilot port also connected to said chamber and a vent port, and an electromagnetic control valve having a port connected between the vent port of said back pressure setting relief valve and said drain and a vent port controlled by an output of a driver actuated by a difference between said signal representing said screw retraction speed and said reference screw retraction speed.

4,802,268

APPARATUS FOR TEXTURIZING YARN

Hsin L. Li, Parsippany; Hendrikus J. Oswald, Morristown, and Alfred L. Liland, Wharton, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 851,919, Nov. 16, 1977, abandoned, which is a division of Ser. No. 675,353, Apr. 9, 1976, Pat. No. 4,074,405, which is a continuation of Ser. No. 527,464, Nov. 26, 1974, abandoned. This application Nov. 19, 1982, Ser. No. 443,086
The portion of the term of this patent subsequent to Feb. 21, 2005, has been disclaimed.
Int. Cl.[4] D02G *1/12, 1/16*
U.S. Cl. 28—254 **13 Claims**



1. Apparatus for crimping a tow of continuous filaments comprising:

(a) a chamber having an inlet opening for receiving the filaments, and an outlet opening for withdrawing the filaments;

(b) a movable perforate yarn-receiving means at least partially disposed in said chamber adjacent said inlet opening;

(c) a stationary, noncontinuous impacting surface disposed in said chamber adjacent said inlet opening;

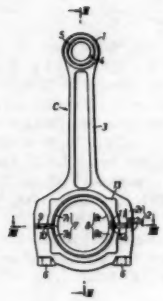
(d) fluid directing means having an angular disposition relative to said impacting surface for directing a stream of compressible fluid containing said filaments into contact with said impacting surface to initiate crimping thereof, the angle of disposition ranging from about 15° to 75° and being such that impingement of said filaments on said impacting surface occurs within said chamber; said yarn receiving means being adapted to separate the major portion of said fluid from said filaments and to expel it from said chamber and to provide a continuously moving surface associated with said chamber, the velocity of said surface being adjusted to cause overfeeding of said filaments into said chamber, the ratio between the velocity of said filaments and the velocity of said surface and the angular disposition of said fluid directing means being such that said filaments are initially crimped by impact against said impacting surfce and deflected therefrom against a mass of said tow to produce final crimping of the filaments, and emerge from the chamber in crimped form.

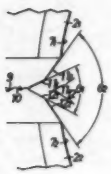
4,802,269

METHOD FOR PRODUCING CONNECTING ROD OF RECIPROCATING MOTION SYSTEM

Masato Mukai, Saitama, and Koichi Komatsu, Shizuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 775,987, Sep. 13, 1985, Pat. No. 4,693,139. This application Jun. 11, 1987, Ser. No. 61,875
Claims priority, application Japan, Sep. 14, 1984, 59-193229
Int. Cl.[4] B21D *53/10*
U.S. Cl. 29—149.5 C 4 Claims





1. A method of producing a connecting rod of a reciprocating motion system wherein the connecting rod includes a larger diameter end portion having a bearing hole formed therein and a bearing metal incorporated into the bearing hole, said larger diameter end portion being divided into body side bearing half and a bearing cap that are connected together by bolts means, the method comprising:

subjecting a blank to a forging operation to produce an intermediate connecting rod product having an enlarged diameter end portion containing opposite end surfaces and a hole axially therethrough;

providing continuous grooves of a generally V-shaped section on the opposite end surfaces of said product and transversely through said hole, said transversely extending grooves being formed as continuations of said end surface grooves;

at least said transversely extending grooves having oppositely facing, inclined surfaces including a first, gently inclined portion and a second, steeply inclined portion; and

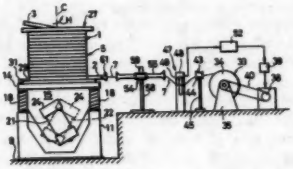
dividing said larger diameter end portion into said bearing half and said bearing cap along said generally V-shaped grooves.

4,802,270

APPARATUS FOR PASSING OPTICAL FIBERS THROUGH TUBULAR PRODUCTS

Kunio Kashiwaya, Tokyo; Hiroyo Haga, Sagamihara; Nobuo Saeki, Tokyo; Youichi Yabuki, Tokyo; Kuniyuki Ozoe, Tokyo; Shinichi Fukushima, and Kazufumi Tabata, both of Narashino, all of Japan, assignors to Nippon Steel Corp. and Nippon Steel Welding Products & Engineering Co., Ltd., Tokyo, Japan

Division of Ser. No. 11,917, Feb. 5, 1987. This application Jan. 4, 1988, Ser. No. 140,666
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—241 14 Claims



1. An apparatus for passing an optical fiber through a tube which comprises:

a cylindrical body around which the tube to admit the optical fiber is coiled;

means to vibrate the cylindrical body in such a manner that a given point of the tube reciprocates along a helical path; and

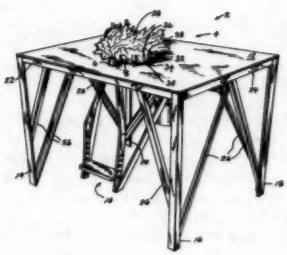
means to feed the optical fiber into the coil of tube being thus vibrated from one and thereof, whereupon the optical fiber fed into the tube moves forward under the influence of the intermittent conveying force exerted by the inner wall of the tube in the direction of the circumference of the coil of tube, said feeding means including means to positively feed the optical fiber at a speed substantially the same as the speed of forward movement of the optical fiber through the coil of tube.

4,802,271

WREATH MAKING MACHINE

Richard Bader, 2002 Parkfield Dr., West Bend, Wis. 53095

Filed Jul. 22, 1987, Ser. No. 76,531
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—243.56 9 Claims



1. An apparatus for making wreaths or the like, said wreaths being formed on a frame having a plurality of clips for retaining greens or the like on said frame, each said clip having a base member connected to said frame and a pair of spaced arms extending therefrom, each said arm having a proximal end connected to said base member and a distal end spaced therefrom, said clip being adapted to receive said greens or the like between said spaced arms, said apparatus comprising:

a support structure including a platform-like upper work surface;

a pair of opposed movable jaws maintained in a fixed position relative to said support structure adjacent said work surface, said jaws being movable between an open position for receiving said clip therebetween and a closed position for crimping said clip about said greens or the like, each said jaw having a face portion for engaging said clip during movement of said jaws from said open position to said closed position, said face portion of each said jaw having an arcuate indentation formed therein, said indentations cooperating during movement of said jaws from said open position to said closed position to securely crimp said clip about said greens or the like by forming said clip to a substantially elliptical shape with portions of said clip overlapping; and

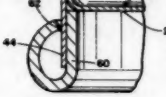
actuator means connected to said jaws and operable to cause said jaws to be moved from said open position to said closed position, said actuator means being interconnected with said support structure below said upper work surface.

4,802,272

PROCESS FOR REFURBISHING CONTAINERS

Robert J. Beaudrie, 1038 Park Cir., Girard, Ohio 44240

Filed Oct. 16, 1987, Ser. No. 109,452
Int. Cl.[4] B23P *7/00*
U.S. Cl. 29—407.07 **22 Claims**



1. A process for reconditioning containers comprising the steps of:

cutting an end member from a sidewall of a used container to define a terminal end;

forming an indentation on said sidewall a preselected dimension from said terminal end;

inserting a new end member having an extending leg portion for receipt in the sidewall and engagement with the indentation, said inserting step including positioning said leg portion for initial receipt in said sidewall; and,

welding said sidewall along said indentation for sealing said new end member to said sidewall.

4,802,273

HYDRAULIC EXPANSION TOOL FOR TUBULAR ELEMENT

Jean E. Widart, Saint Severin, Belgium, assignor to Cockerill Mechanical Industries, Belgium

PCT No. PCT/BE86/00024, § 371 Date Feb. 26, 1987, § 102(e) Date Feb. 26, 1987, PCT Pub. No. WO87/00457, PCT Pub. Date Jan. 29, 1987
PCT Filed Apr. 17, 1986, Ser. No. 33,100
Claims priority, application Belgium, Jul. 18, 1985, 0/215371
Int. Cl.[4] B23P *11/00*; B21D *26/02*
U.S. Cl. 29—421.1 **7 Claims**

1. A hydraulic expansion tool for a tubular element, said tool comprising:

an elongated body having two opposed ends and an external surface;

a first seal having a first head portion and a first skirt portion, said first head portion disposed at one end of the elongated body and said first skirt portion surrounding the one end of the elongated body and oriented towards the opposite end of the elongated body, said first seal suitably dimensioned and flexible to seal an inner surface of a tubular element when said tool is introduced into said tubular element;

a second seal having a second head portion and a second skirt portion, said second head portion disposed at the opposite end of the elongated body and said second skirt portion surrounding the opposite end of the elongated body and oriented towards the one end of the elongated body, said second seal suitably dimensioned and flexible to seal said inner surface of said tubular element when said tool is introduced into said tubular element;

first compression means for securing and sealing said first head portion of said first seal against said one end of said elongated body;

second compression means for securing and sealing said second head portion of said second seal against said opposite end of said elongated body; and

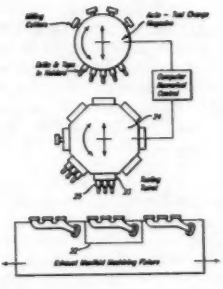
means, axially traversing one of said first or second compression means, for communicating pressurized fluid from outside to within a space defined by the first and second seals and the external surface of the tubular body.

4,802,274

METHOD OF DETERMINING WORN ROTARY TOOL

Robert C. Petrof, Farmington Hills, and Charles O. McHugh, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 4, 1987, Ser. No. 46,066
Int. Cl.[4] B23Q *3/156*; B23B *49/00*
U.S. Cl. 29—568 **12 Claims**



1. A method of determining worn rotary tools during machining operations, comprising:

(a) establishing the steady-state dominant tool force level required to (i) carry out a rotary machining operation at a

given set of cutting conditions in the abrasive wear regime, (ii) using a known worn rotary tool with a given geometry, and (iii) using a workpiece of given material;

(b) supporting another rotary tool of the same given geometry in a holder for being power driven for rotation, said holder having means to impart a signal in resonse to exceeding a predetermined force level calibrated to be just below the steady-state force level of the worn tool; and

(c) while employing said another tool to rotary machine a workpiece of the same given material, initiating an automatic tool change in response to a signal imparted by said means of said holder for said another tool.

4,802,275

METHOD OF MANUFACTURING AN ELECTROCHEMICAL CELL HAVING AN ALKALINE ELECTROLYTE AND SPIRAL-WOUND ELECTRODES

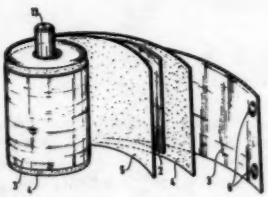
Jean-Pierre Freluche, Angouleme, France, assignor to Saft, S.A., Romainville, France

Filed Mar. 3, 1988, Ser. No. 163,831

Claims priority, application France, Mar. 12, 1987, 87 03391

Int. Cl.[4] H01M *4/26, 10/28*

U.S. Cl. 29—623.4 **5 Claims**



1. A method of manufacturing an electrochemical cell having an alkaline electrolyte and spiral-wound electrodes, the method consisting:

in superposing four items: a positive electrode, a separator, a negative electrode, and another separator, with the two separators optionally between two lengths of a common separator;

in winding these four items around a core in order to obtain a roll; and

in inserting said roll in the can of the cell; the method including the improvement whereby, at the end of the winding operation, the end of one of the elements is fixed on the preceding turn of the same element by means of a hot melt glue which is not soluble in said alkaline electrolyte.

4,802,276

APPARATUS FOR PRINTED WIRING BOARD COMPONENT ASSEMBLY

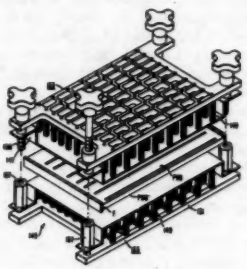
Corey H. Bowcutt, Annapolis; John J. Buckley, Jr., Baltimore, and James A. Rew, Millersville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1987, Ser. No. 32,429

Int. Cl.[4] H05K *3/30, 3/34*

U.S. Cl. 29—739 **15 Claims**

1. An apparatus for supporting at least a first printed wiring board and for maintaining a predetermined constant force on components which have been mounted on the at least first printed wiring board said apparatus comprising: a frame means defining a generally U-shaped member having an upper and a lower surface, said U-shaped member having a slot means therein for slidingly and removably receiving the at least first printed wiring board therein; an upper cover member and a lower cover member which cooperate with the upper and lower surfaces of the U-shaped member to generally enclose the at least first printed wiring board; resilient biasing means comprising a plurality of compliant pads, each having an area at least equal to that of the at least first printed wiring board, the means disposed between the at least first printed wiring board and the cover members; and means for removably securing the cover members to the U-shaped member, whereby a predetermined constant force is maintained on components which have been mounted on the at least first printed wiring board.



4,802,277

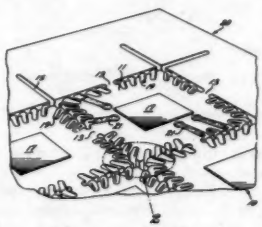
METHOD OF MAKING A CHIP CARRIER SLOTTED ARRAY

Randolph E. Root, Westminster, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 722,644, Apr. 12, 1985, abandoned. This application Nov. 23, 1987, Ser. No. 124,229

Int. Cl.[4] H01L *23/48;* **H05K** *3/10*

U.S. Cl. 29—846 **21 Claims**



1. A method of making a chip carrier array comprising the steps of:

providing a substrate; and

forming elongated slots in the substrate which extend beyond the corners of individual chip carriers to define edges thereof and which form one severable interconnecting bridge at each edge of each chip carrier, each edge of each chip carrier including first and second edge portions separated by a respective interconnecting bridge, which bridges maintain the individual chip carriers in the chip carrier array.

4,802,278

GEAR DRIVEN TUBE CUTTER

Jerald Vanderpol, Eldorado Hills; Neil Pfafman, Placerville, and Cory J. Silber, Sacramento, all of Calif., assignors to Tri Tool, Inc., Rancho Cordova, Calif.

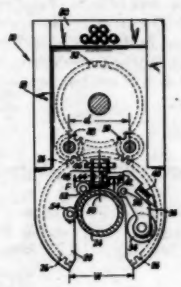
Filed Aug. 6, 1987, Ser. No. 82,135

Int. Cl.[4] B23D *21/06*

U.S. Cl. 30—97 **25 Claims**

1. A gear driven cutting tool for cutting through a wall of tube comprising:

(a) a cutting body defining a first slot opening outwardly through a first end to accommodate a tube therein;
(b) a cutting head rotatably mounted within the cutting body so as to rotate about a first axis, the cutting head defining a second slot;
(c) a generally "C" shaped driven gear attached to the cutting head such that an opening defined by the generally "C" shape coincides with the second slot, the opening having a width w measured at the mouth of the "C";
(d) at least first and second spur gears rotatably mounted in the cutting body so as to rotate about second and third

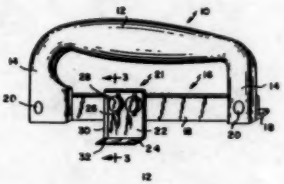


axes, the spur gears operatively engaging the generally "C" shaped gear, the second and third axes being spaced apart by a distance d such that d>w;
(e) cutting means mounted on the cutting head and adapted to extend into the second slot so as to bear against a tube therein;
(f) feed means operatively associated with the cutting means to urge the cutting means against the tube; and
(g) gear drive means operatively engaging the first and second spur gears so as to cause rotation of the cutting head about the first axis to draw the cutting means about the periphery of the tube to thereby sever the tubing wall.

4,802,279
GAME HUNTING KNIFE
Jerry D. Rowe, Lander, Wyo., assignor to Rocky Mountain Enterprises, Inc., Lander, Wyo.
Filed Apr. 17, 1987, Ser. No. 40,268
Int. Cl.[4] B26B *3/04*
U.S. Cl. 30—155 **13 Claims**

1. A knife, comprising an elongated handle, a cutting blade, a pivot unit connected to said handle and said blade and pivotally supporting said blade to one end of said handle, said handle having a slot extending from said pivot unit for a length exceeding the length of said blade, a shield means coupled to said pivot unit and pivoted to said handle for movement in the path of said blade, said shield having a length greater than said blade and pivotal between a first position abutting said handle with said blade in said slot and a second position pivotally outwardly and angulated relationship to said handle at a angle no greater than 45° and defining a back support for said blade whereby said blade is pivotal outwardly into engagement with said shield with said cutting edge facing said handle for eviscerate cutting of an animal.

4,802,280
DEVICE FOR REMOVING PUTTY FROM A WINDOW
John LaPiana, 89 Pennsylvania Ave., Somerville, Mass. 02145
Filed Feb. 11, 1988, Ser. No. 151,158
Int. Cl.[4] B26B *27/00*
U.S. Cl. 30—293 **1 Claim**

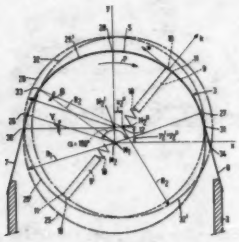


1. A tool for removing putty from the recess around a window frame within which the edge of the glass is mounted, comprising an elongate, U-shaped handle embodying a handle grip portion and longitudinally-spaced attaching legs disposed at right angles to the handle, an elongate guide of L-shaped cross section defining an attaching flange for attachment to the legs and a guide flange for engagement with the window frame adjacent the glass-receiving opening, bolts attaching the attaching flange to the legs at one side of the legs in a position such that the guide flange extends at right angles to the legs in a direction away from the legs and a detachable, adjustably-mounted, L-shaped cutting blade mounted to the attaching flange at the side thereof opposite the guide flange, said L-shaped cutting blade embodying right-angularly disposed legs comprising a first leg and a second leg, transversely-spaced, parallel cutting edges at the opposite edges of the legs, means comprising second bolts detachably mounting the first leg of the cutting blade to the attaching flange in a position such that the second leg extends downwardly from the guide flange and in a direction away from the attaching flange at right angles thereto and wherein said first leg contains spaced, parallel, elongate slots perpendicular to the second leg for receiving the attaching bolts and wherein said second flange contains threaded openings for receiving the second bolts by means of which the L-shaped cutting blade is attached to the attaching flange for adjustment relative to the guide flange.

4,802,281
DRY SHAVING APPARATUS
Eduard W. Tietjens, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.
Continuation of Ser. No. 943,471, Dec. 16, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 205,599
Claims priority, application Netherlands, Dec. 20, 1985, 8503519; Taiwan, Apr. 24, 1986, 75-101838
Int. Cl.[4] B26B *19/14*
U.S. Cl. 30—43.6 **1 Claim**

1. A dry-shaving apparatus comprising a housing supporting a holder for a longitudinally extending shear plate provided with hair-entry apertures; and an associated longitudinally extending cutter rotatable about an axis of rotation, said cutter including a carrier having cutting elements movable relative to the carrier in substantially radial directions, each cutting ele-

ment having a cutting edge at its radial end; the shear plate having a central portion shaped as a part of a circularly cylindrical surface and formed with the hair-entry apertures, said central portion partly surrounding the cutter; the cutting edges of the cutting elements of the cutter, as it rotates, following a constrained path defined by the shear plate and a free path where the cutting edges are disengaged from the shear plate; the shear plate also having two peripheral portions respectively adjoining the central portion of the shear plate for securing the shear plate to the holder; the shear plate having a first shear-plate transition between one peripheral portion and its central portion, the cutting edge of each cutting element changing from the free path to the constrained path in the vicinity of the first shear-plate transition, and having a second shear-plate transition between the other peripheral portion and its central portion, the cutting edge of each cutting element



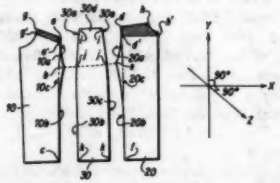
changing from the constrained path to the free path in the vicinity of the second shear-plate transition; the free path followed by the radial ends of the cutting elements being situated on a cylindrical surface having its axis coinciding with the axis of rotation of the cutter; a line from the axis of the circularly cylindrical shear plate through the centre of the central portion of the shear plate defining a positive y-axis, and a line perpendicular to such y-axis from the axis of the circularly cylindrical shear plate towards the second shear-plate transition defining a positive x-axis; and the axis of rotation of the cutter being situated closer to the second shear-plate transition than to the first shear-plate transition and also being situated in the quadrant defined by the positive x-axis and the positive y-axis whereby said cutting elements enter and leave the first and second shear-plate transitions reducing the effects of collisions between the cutting elements and the shear plate.

4,802,282

MASTER PATTERN FOR UPPER GARMENTS

Shoji Fujimura, Yamatokoriyama, and Toru Kawai, Osaka, both of Japan, assignors to Shikibo Ltd., Osaka, Japan

Filed Jul. 16, 1987, Ser. No. 74,179
Claims priority, application Japan, Jul. 18, 1986, 61-170490
Int. Cl.[4] A41H *3/06*
U.S. Cl. 33—12 **2 Claims**



1. A master pattern for an upper garment, said master pattern comprising front, rear and lateral parts, each of said front and rear parts having a first sewing side line at one side thereof, each of said first sewing side lines having an upper end, a first substantially straight lower portion and an outwardly projected upper portion therebetween, each of said outwardly projected upper portions having a bulging portion intermediate said first substantially straight lower portion and said upper end meeting to define an apex for constituting a sleeve root, said lateral part having two second sewing side lines at each side thereof and including an upper portion for constituting a sleeve bottom and a lower portion for interconnecting said front and rear parts, each of said two second sewing side lines having a second substantially straight portion at said lower portion thereof,

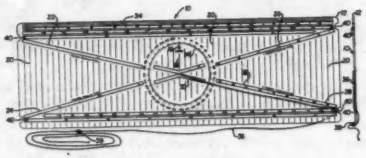
wherein each of said first substantially straight lower portions and a lower half of each of said bulging portions of first sewing side lines may be sewn with each of second substantially straight portions of said two second sewing side lines, and each of said upper ends, each said apex and an upper half of each of said bulging portions may be sewn with a sleeve root.

4,802,283

HEADING AND DISTANCE MEASURING DEVICE AND METHOD

Thomas R. Trump, P.O. Box 586, Moodus, Conn. 06469

Filed May 12, 1987, Ser. No. 48,835
Int. Cl.[4] G01C *21/20*
U.S. Cl. 33—431 **15 Claims**



1. A navigation device adapted for use with a selected navigation chart comprising,

a generally elongated, rectangular, at least partially transparent substrate,

a compass rose on said substrate,

at least one linear distance scale on said substrate, said linear distance scale being adapted for use with said chart and havign its origin coincident with the center of said compass rose and wherein said linear distance scale radiates outwardly from the center of said compass rose in a direction generally toward an edge of said device and is discontinuous along its length and comprises an initial portion and a distal portion laterally offset from said intial portion, and

an elongated flexible member adapted for placement along said linear distance scale, said elongated flexible member being operatively affixed at one end to the center of said compass rose and the origin of said linear distance scale and having its distal end free so that said flexible member can be placed in coinciding relationship along said linear distance scale.

4,802,284

LOCATING DEVICE USED WITH ELECTRICAL OUTLET BOXES AND THE LIKE

Christopher A. Jackson, 9771 Acacia Ave., #8, Garden Grove, Calif. 92641

Filed Feb. 24, 1987, Ser. No. 17,931
Int. Cl.[4] G01B *5/14*
U.S. Cl. 33—528 **2 Claims**

1. A device for locating the open sides of either a single outlet or double outlet electrical box during installation of a panel which covers said open sides, including,

a locator plate having an inside surface,

a pair of outlet alignment pins connected to and extending

outwardly from said inside surface which hold the locator plate over the open side of either the single outlet or double outlet electrical box when said locator plate is placed in position prior to installation of the panel,

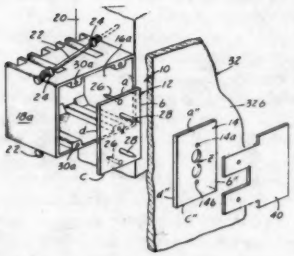
said outlet alignment pin

(a) holding the locator plate over open side of a double outlet electrical box with the center of the locator plate displaced with respect to the center of the open side of the double outlet electrical box and the inside surface abutting at least partially the edges of the said open side of the double outlet electrical box, and

(b) holding the locator plate over the open side of a single outlet electrical box with the center of the locator plate coinciding with the center of the open side of said single outlet electrical box and the inside surface of the locator plate abutting the edges of said open side of the single outlet electrical box,

a pair of template alignment pins connected to and extending outwardly from the locator plate opposite the side from the outlet alignment pins,

a template having a pair of openings therein which receive



the template alignment pins when the template is assembled with the locator plate, said template serving as a guide for a cutting tool to cut away the section of the panel disposed between the locator plate and the template, and having dimensions of the single outlet electrical box such that, when positioned to overlie the open side of a single outlet and assembled with the locator plate, the center of the template is in registration with the center of the open side of said single outlet electrical box and the perimeter of the template extends slightly beyond the perimeter of said side,

an extension plate having a pair of openings therein which receive the template alignment pins when the template is assembled with the extension plate, said extension plate, when assembled with the template, providing a template assembly for a double outlet electrical box that, when positioned to overlie the open side of the double outlet electrical box, provides that the template assembly is in registration with the center of the open side of the double outlet electrical box and the perimeter of the template assembly extends slightly beyond the perimeter of said open side of the double outlet electrical box.

4,802,285

METHOD AND APPARATUS FOR ASCERTAINING THE RADIAL LOCATION OF A NEW WHEEL PROFILE TO BE PRODUCED BY A REPROFILING OPERATION

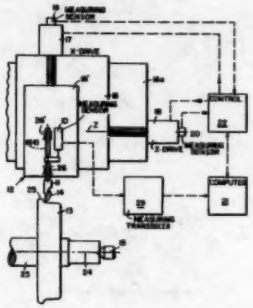
Herbert Ligacz, Erkelenz; Alfred Heimann, Aachen; Hartwig Klosterhalfen, Duren, and Helmut Wittkopp, Erkelenz, all of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 63,245

Claims priority, application European Pat. Off., Jun. 28, 1986, 86108841.7

Int. Cl.[4] G01B 5/20, 7/28

U.S. Cl. 33—551 **11 Claims**



1. A method for ascertaining the radial position of a new profile to be produced by a reprofiling operation with reference to an actual, worn profile not corresponding to a rated profile of a railroad wheel having a fixed location relative to a reference point and of which the axial position of the actual profile is known, comprising the following steps:

(a) ascertaining in a sensing or measuring plane of each wheel (13) at least one surface point (P1) on the wheel tread,

(b) ascertaining the radial distance in the X-direction of said surface point (P1) to said reference point,

(c) ascertaining in different, but given radial locations at least two points (P3, P4) at each rim flank by an axial gaging in the Z-direction,

(d) ascertaining the radial and axial location of said at least two points (P3, P4) relative to a reference profile, and

(e) ascertaining the radial location of a rated profile (32, 32') which rated profile forms a tangent with at least one of the ascertained points, whereby simultaneously at least the other sensed points of the actual profile are located on the rated profile or radially outside the rated profile.

4,802,286

METHOD AND APPARATUS FOR FREEZE DRYING

Masakazu Kobayashi, Tokyo; Konomi Harashima, Yokohama, and Hiroichi Ariyama, Iwatsuki, all of Japan, assignors to Kyowa Vacuum Engineering, Ltd., Tokyo, Japan

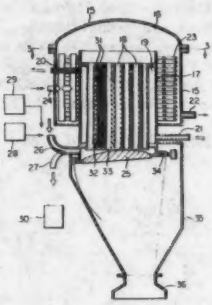
Filed Feb. 9, 1988, Ser. No. 154,151

Int. Cl.[4] F28B 5/04

U.S. Cl. 34—15 **6 Claims**

1. A method for freeze drying, comprising the steps of: supplying a predetermined amount of water onto a refrigerating/heating surface provided inside a drying chamber of a vacuum-type freeze drying apparatus, said refrigerating-/heating surface being cooled to a temperature below 0° C. to form an ice film having a predetermined thickness thereon; keeping said refrigerating/heating surface at a temperature below 0° C.; under such conditions, supplying a material to be dried onto a surface of said ice film to cause said material to

freeze on said ice film; and producing a vacuum in said drying chamber of said vacuum-type freeze drying apparatus,



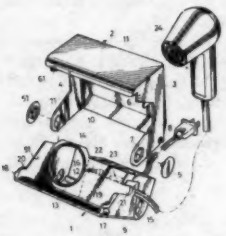
whereby sublimation of said ice film and said material frozen thereon occurs.

4,802,287

TWO-PURPOSE DEVICE OF HAND AND HAIR DRYERS

Shye L. Chen, Taipei, Taiwan, assignor to Tatung-Conair Corporation, Taipei, Taiwan

Filed Sep. 16, 1987, Ser. No. 97,120
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—91 **3 Claims**



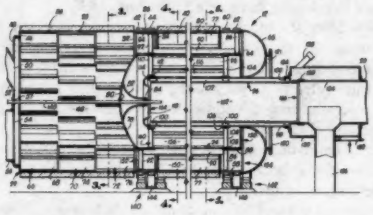
1. A combination hair and hand dryer device comprising a portable hand-held electric hair dryer and a cabinet for mounting the hair dryer on a wall or the like so as to convert same to a hand dryer, the cabinet comprising a base part with a base wall, side arms extending from the base wall, and a top cover, the cabinet further comprising a front part having side walls, a front wall with a vent, and internal means for releasably securing the hair dryer therein in a position to blow heated air through the vent, the cabinet still further comprising pivot means connecting the side walls to the side arms for swinging the front part between open and closed positions relative to the base part, for insertion and removal or the hair dryer in the open position and operation of the device as a hand dryer in the closed position, and catch means on the front part and base part for releasably retaining the front part in the closed position.

4,802,288

ROTARY DRUM DRYER AND METHOD

Donald E. Shinn, and Andrew D. Livingston, both of Independence, Kans., assignors to Productization, Inc., Independence, Kans.

Division of Ser. No. 33,344, Apr. 1, 1987, Pat. No. 4,729,176.
This application Nov. 27, 1987, Ser. No. 125,864
Int. Cl.[4] F26B *11/02*
U.S. Cl. 34—136 **5 Claims**



1. A multiple-pass product dryer, comprising:

an elongated, normally horizontally disposed, axially rotatable body having means defining a plurality of elongated, substantially concentric, internal passageways each having an entrance end and an exit end and being in communication with each other to present a continuous, serpentine flow path through said body;

means defining a wet product inlet and a dried product outlet at respective ends of said flow path;

means for inducing flow of heated air currents within said body and along said flow path for conveying said product therealong in a cocurrent fashion with said air currents, and for simultaneously drying the initially wet product; and

means for introducing additional quantities of ambient-derived air into the innermost internal passageway of said body at a point for cocurrent passage of said product, heated air currents and additional air along said innermost passageway, said additional air having a lower relative humidity than the induced air currents entering said innermost passageway,

said air introduction means comprising an elongated tubular element disposed about the defining walls of said innermost internal passageway to define therewith an elongated zone, means adjacent the entrance end of said innermost internal passageway and in communication with said zone for directing said additional quantities of air into and along the length of the innermost internal passageway, and means located exteriorly of said body and in communication with said zone for delivery of said additional quantities of air into and along the length of the zone.

4,802,289

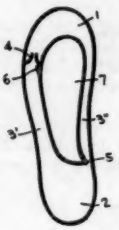
INSOLE

Hans Guldager, Rypevang 4, Allerod, Denmark (3450)

Filed Mar. 25, 1987, Ser. No. 29,816
Int. Cl.[4] A43B *13/38*
U.S. Cl. 36—43 **9 Claims**

1. Insole for footwear and of the kind that consists at least partly of a case of a soft, flexible foil material, filled with fluid, and characterized by the fact that the interior of the case is divided into cells mutually connected by ducts, out of which one cell (1) is confined tb a toe area of the sole so that in use it is under a user's toes, and one other cell (2) is placed in the heel area of the sole, and where the above-mentioned cells (1) and (2) are mutually connected via at lease two ducts (3), one of the ducts including a non-return valve (4) which permits flow of fluid through said one duct between the cells (1) and (2) in one

direction and obstructs flow through said one duct in the opposite direction the other of said ducts including throttling



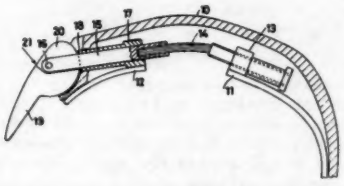
means (5), which permits slow flow through the other of said ducts between the cells (1) and (2) in the opposite direction.

4,802,290

CLAMPING DEVICE FOR SHOES AND BOOTS

Antonello Marega, Montebelluna, Italy, assignor to Calzaturificio Tecnica Spa, Treviso, Italy

Filed Jul. 9, 1987, Ser. No. 71,441
Claims priority, application Italy, Jul. 10, 1986, 22501/86[U]
Int. Cl.[4] A43B *5/04*; A43C *11/00*
U.S. Cl. 36—119 **11 Claims**



1. Clamping device for band-like members in shoes and boots in which a foot is releasably clamped to the shoe, said device comprising:

a control lever located at an outer surface of the shoe, said lever being pivotally actuatable between a lever clamping position and a lever unclamping position;

a cam part rigidly connected to said lever and actuatable with said lever between a first clamping position and a second unclamping position;

an anchoring member connected to an edge to be clamped, said anchoring member being adjustably connected to one end of a guy member, the other end of said guy member being engagable with said cam part when in said first clamping position;

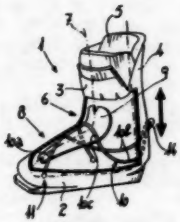
a sleeve member freely axially slidable along said guy member and connected to a second edge to be clamped, whereby actuation of said control lever to said lever clamping position causes said cam part to be actuated towards said first clamping position, said cam part engaging said sleeve member to cause a relative sliding motion between said guy member and said sleeve to bring said second edge towards said first edge.

4,802,291

SKI BOOT INCORPORATING A FOOT SECURING DEVICE

Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.P.A., Montebelluna, Italy

Filed Jul. 20, 1987, Ser. No. 75,717
Claims priority, application Italy, Jul. 25, 1986, 82560 A/86
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—119 **10 Claims**



1. In a ski boot incorporating a foot securing device, said ski boot comprising an upper, a substantially elongated shell having a toe portion, a heel portion, an instep portion and a metatarsal portion, a foot presser mounted internally of said shell so as to face said intep and metatarsal portions thereof, a single traction element mounted internally of said shell for acting on said presser at least partially, said traction element including a first overlapping said presser adjacent said metatarsal portion of said shell, a second tract extending internally of said shell between said metatarsal and said heel portion thereof, and a third tract overlapping said presser adjacent said instep portion of said shell, the improvement consisting of the fact that said first tract of said traction element extends obliquely with respect to the longitudinal direction of said shell from one side to the other thereof to thereby embrace said presser both transversely and longitudinally thereof.

4,802,292

CONTINUOUS MINING DEVICE FOR CRUST DEPOSITS, ETC. AND CONTINUOUS LINE BUCKET METHOD WITH TURNING MOVEMENT

Yoshio Masuda, Kanagawa, Japan, assignor to Hideaki Fukada, Tokyo, Japan, a part interest

Filed Feb. 9, 1987, Ser. No. 12,453
Claims priority, application Japan, Feb. 13, 1986, 61-27933
Int. Cl.[4] E02F *3/14*
U.S. Cl. 37—69 **7 Claims**

1. A method for mining crust deposits and the like located underwater with a maneuverable sea vessel of the type having a bow, a stern, port and starboard sides, an endless cable means of a selected length, means for engaging a portion of said cable

means for moving said cable means to pay out and pull in said cable means, a plurality of bucket means attachable to said cable means at spaced intervals, at least two guide means for said cable means, said guide means being mountable on the vessel at spaced locations, one of said locations being disposed along one of the sides of the vessel, the other of the locations being at a location including one of the stern and the other side of the vessel, comprising the steps of:

a. moving the vessel while turning through an arc of between 180° and 360° to one side of the vessel;

b. paying out the cable means from one location including one of the stern and the other side of the vessel with the bucket means attached at said spaced intervals, the length of the cable means paid out being such that at least a portion of the bucket means of the cable means will engage the crust deposits;

c. simultaneously pulling in the cable means with the bucket means on said one side of the vessel which is located on the inside of said arc;

d. maintaining the cable means being paid out from the one location separate from the length of cable means being pulled in and being generally in a straight line while the cable means being paid out traces generally an arc.

3. Apparatus for the mining of crust deposits located underwater with a maneuverable sea vessel having a bow, a stern, port and starboard sides, the apparatus comprising an endless cable means of a selected length, means for engaging a portion of said cable means for moving said cable means to pay out and pull in said cable means, a plurality of bucket means attached to said cable means at spaced intervals, at least two guide means for said cable means, said guide means being mounted on the vessel at spaced locations, one of said locations being disposed along one of the sides of the vessel at approximately two thirds of the length of the vessel measured from the bow of the vessel, the other of the locations being on the other side of the vesel with said one location being used to pull in said cable means and the other location being used for paying out the cable means.

4,802,293

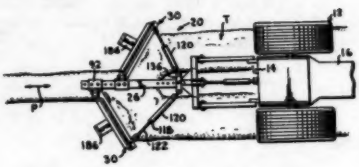
ADJUSTABLE EARTH-MOVING ATTACHMENT FOR A VEHICLE

Raymond H. Smith, Rte.2, 5AAA, Larned, Kans. 67550

Filed Nov. 20, 1987, Ser. No. 123,608

Int. Cl.[4] E02F 5/00

U.S. Cl. 37—108 R **27 Claims**



1. An earth-moving attachment for a vehicle comprising:

a main frame assembly which includes a main frame-to-vehicle attaching means adapted to be mounted on the vehicle, a main beam connected at one end thereof to said main frame-to-vehicle attaching means and extending outwardly therefrom to have the longitudinal centerline thereof aligned with the direction of movement of the vehicle along a path;

a pair of earth-moving blade assemblies which can be movably mounted on said main beam, each earth-moving blade assembly including

a blade for moving earth in a predetermined direction with respect to the path,

an inner edge on said blade locatable adjacent to said main beam,

an outer edge on said blade,

a first blade-to-main beam attaching means attaching said blade to said main beam,

a second blade-to-main frame attaching means attaching said blade to said main beam,

said first blade-to-main beam attaching means including means for adjusting the height of said blade above the path and means for adjusting the position of the inner edge of said blade with respect to said main beam longitudinal centerline, and

said second blade-to-main beam attaching means including means for adjusting the position of the outer edge of said blade with respect to said main beam longitudinal centerline.

4,802,294

FRAME, MORE PARTICULARLY FOR A PICTURE

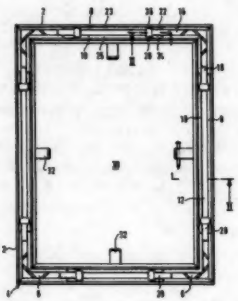
Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Hünbach-Thun, Switzerland

Filed May 4, 1987, Ser. No. 45,565

Claims priority, application Fed. Rep. of Germany, May 3, 1986, 3615117

Int. Cl.[4] A47G 1/06

U.S. Cl. 40—155 **21 Claims**



1. A frame for a picture comprising:

profiled rails joined together at the corners of the frame by means of corner-connectors, each of said rails comprising a cavity and two webs extending in the longitudinal direction of the rail, and said two webs having an opening between them also extending in the longitudinal direction of the rail, said cavity being formed from a substantially U-formed portion of the profiled rail comprising of rearwardly directed legs each carrying one of said two webs, each web projecting laterally toward the web carried by the other leg ,

each of said corner-connectors comprising two plugs formed integrally with each other in a single piece, each plug being inserted from an end inside the cavity of a rail,

at least one of the webs comprising a retaining element projecting rearwardly behind the rear surface of said at lest one web,

each plug comprising in the vicinity of said retaining element a resilient tongue with a free end which extends outwardly from the cavity through the opening between said two webs, said tongue being formed integrally with the plug and having a width which is at the most equal to the width of said opening,

at least one laterally projecting hook element being provided at said free end of the tongue, said hook element extending outside said cavity and overlying said rear surface of said at least one web, said tongues and lateral hook elements having a maximum width no wider than the width of said plugs, and

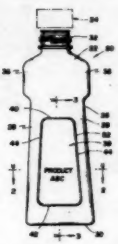
means for locking said hook element to said retaining element.

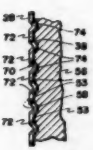
4,802,295

BLOW MOLDED POLYETHYLENE TEREPHTHALATE CONTAINER HAVING IML TEXTURED LABEL WALL AND METHOD FOR MAKING SAME

Richard C. Darr, Seville, Ohio, assignor to Plastipak Packaging, Inc., Plymouth, Mich.

Filed Apr. 28, 1987, Ser. No. 43,640
Int. Cl.[4] G09F 3/08; B65D 23/00
U.S. Cl. 40—310 9 Claims





1. A container comprising: a blow molding made of polyethylene terephthalate and including a noncylindrical wall of a generally uniform thickness having an outer surface; at least one label secured to the outer surface of the wall by in-mold labeling and having upper, lower, and side edges defining junctions with the wall; said wall having abrupt curvatures at the edges of the label to provide a smooth transition at the junctions between the label edges and the outer surface of the wall; the outer surface of the wall outside the perimeter of the label having a relatively smooth surface finish; the outer surface of the label and the outer surface of the wall within the perimeter of the label having a textured surface including isolated depressions; and said label and wall within the perimeter of the label having a combined generally uniform thickness.

4,802,296

ARCHITECTURAL SIGN SYSTEM

Judson L. Kovalak, Jr., Rockford, Mich., assignor to SignComp, Inc., Comstock Park, Mich.

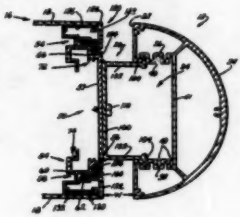
Filed Dec. 30, 1986, Ser. No. 947,688
Int. Cl.[4] G09F 15/00
U.S. Cl. 40—607 18 Claims

1. An architectural sign structure comprising:

a pair of support columns, each column fabricated as a one-piece extrusion defining an outer surface, an inner surface and an elongated channel-shaped groove opening through said inner surface, said channel-shaped groove including spaced, parallel sidewalls, said sidewalls defining a plurality of opposed reveal grooves;

a sign body including a plurality of body members defining the sides thereof;

a pair of elongated reveals, each reveal being attached to opposed sides of said sign body and including outwardly extending slide flanges, said slide flanges being selectively



disposed within opposed ones of said reveal grooves to provide a variable reveal; and

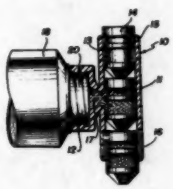
a sign face retainer joined to said sign body.

4,802,297

BULLET LUBRICATING APPARATUS

Kendrick L. French, Lebanon, Me., assignor to K. W. Thompson Tool Company, Inc., Rochester, N.H.

Filed Oct. 16, 1987, Ser. No. 109,497
Int. Cl.[4] F41C 27/00
U.S. Cl. 42—90 2 Claims



1. Apparatus for use in lubricating bullets, comprising:

(a) a main body having a bore with a diameter slightly larger than the diameter of one of the bullets, the bore extending completely through the main body and having an entrance into which the bullets may be introduced seriatim as well as an exit from which a bullet may be ejected, and

(b) a branch portion extending at a right angle to the centerline of the bore, the said portion being adapted to fit over a discharge opening of a container of lubricant, the branch portion having a passage adapted to lead from the discharge opening of the said container to the midpoint of the bore of the main body, the main body and the branch portion being integrally formed of clear plastic, so that flow of lubricant around a bullet can be observed, the length of the bore being equal to the length of three bullets, so that one bullet can reside adjacent the entrance to the bore, another bullet can reside in the midportion of the bore adjacent the said passage, and another bullet can reside adjacent the exit of the bore, wherein the bore adjacent the exit is provided with a counterbore to facilitate the movement of the bullet out of the bore, and wherein a plurality of pads occupy a portion of the counterbore adjacent the midportion of the bore to guide the bullet through the counterbore.

4,802,298

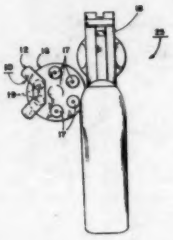
GUN CYLINDER LOCK DEVICE

Donald G. Baugus, 1139 Terrell St., Mebane, N.C. 27302

Filed Apr. 8, 1988, Ser. No. 179,635
Int. Cl.[4] F41C 27/00
U.S. Cl. 42—70.11 9 Claims

1. A cylinder lock device for a gun cylinder comprising: a chamber stud, a pawl, said pawl connected to said chamber

stud, said pawl having a radial section, said radial section extending outwardly beyond said cylinder when said chamber



stud is positioned in a cylinder chamber whereby said radial section will stop the cylinder rotation to prevent the gun from firing.

4,802,299

REEL MOUNTING DEVICE ON FISHING RODS

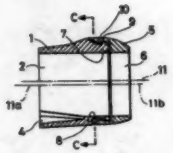
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka, Japan

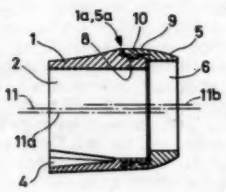
Filed Aug. 11, 1987, Ser. No. 84,024

Claims priority, application Japan, Aug. 20, 1986, 61-194783; Nov. 14, 1986, 61-272585; May 29, 1987, 62-137426

Int. Cl.[4] A01K *87/06*

U.S. Cl. 43—22 **10 Claims**





1. A reel mounting device for use with a fishing rod, comprising:

a first elongated sleeve member having a first bore for passing said fishing rod, a first and second end, and an inner surface;

a first longitudinal recess for receiving a foot portion of the reel, said longitudinal recess being formed in the inner surface of said first sleeve member at said first end of said first sleeve member with said first longitudinal recess being formed partially along the length of the first sleeve member;

a first annular connecting portion, said first connecting portion being formed at the second end of said first sleeve member;

a second elongated sleeve member having a second bore for passing said fishing rod, and a first and second end;

a second annular connecting portion, said second connecting portion being formed at the first end of said second sleeve member;

wherein the axis of said first bore is eccentrically disposed relative to the axis of said first annular connecting portion and the axis of said second bore is eccentrically disposed relative to the axis of said second annular connecting portion with said second annular connecting portion being adapted to rotatably connect and coaxially cooperate with said first connecting portion.

4,802,300

FISHING HOOK

Toshitaka Fujii, and Haruyuki Fujii, both of 481 Gonose-cho, Nishiwaki-shi, Hyogo, Japan

Continuation-in-part of Ser. No. 850,036, Apr. 10, 1986, abandoned. This application Jun. 19, 1987, Ser. No. 64,812

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—43.16 **1 Claim**

1. A fishing hook having a shank (4), a bend (5), and a barb (7), characterized in that a tip (6) of said barb is flattened to form wedge-like blade and that an interior angle α between an edge line of said blade and the longitudinal axis of said barb in a plane of said hook is substantially 90 degrees.

4,802,301

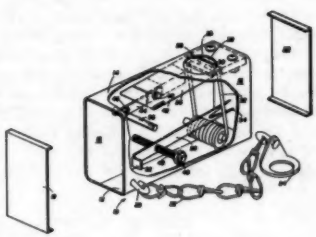
HUMANE RACCOON TRAP

Jack E. Isborn, deceased, late of Talmage, Calif., and Nora S. Isborn, heir, P.O. Box 327, Talmage, Calif. 95481

Filed May 27, 1988, Ser. No. 199,440

Int. Cl.[4] A01M *23/00*

U.S. Cl. 43—58 **8 Claims**



1. An animal trap comprising:

a housing including a top panel, bottom panel, opposing side panels and end closures;

means forming an opening in said top panel of a size to receive closely the paw of a small animal;

a gate in said housing closely spaced below said top panel;

said gate being mounted for movement between set position and a sprung position, respectively displaced from and underlying said opening;

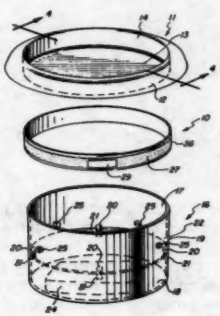
strong spring means biasing said gate into said sprung position;

a trigger arm in said housing;

a pivot rod extending between said side panels;

said trigger arm being pivotally mounted between the ends thereof on said pivot rod;
bait attaching means at one end of said trigger arm beneath said opening;
a first latch member extending laterally from the other end of said trigger arm;
a complementary latch member depending from and pivotally carried on said gate;
a fulcrum rod extending between said side panels above said other end of said trigger arm so that with said gate in set position said complementary latch member may be pivoted down and forward against said fulcrum rod and engaged by said first latch member; and
means for positioning said trigger arm laterally on said pivot rod to align said first latch member with said second latch member.

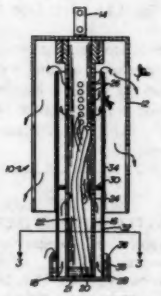
4,802,302
INSECT TRAPPING PET FOOD DISH
Fahad A. Alnafissa, 2407 Wilshire Blvd., Suite 4, Santa Monica, Calif. 90403
Filed Nov. 3, 1987, Ser. No. 116,529
Int. Cl.[4] A01M *1/14*
U.S. Cl. 43—114 12 Claims



1. An insect-diverting pet food dish comprising
a. a cylindrical base section having an upper cylindrical wall section adapted to receive an encircling band having an insect trapping outer layer,
b. a dish section having a concave upper wall surface and a convex lower wall surface supportable on said base section, said concave dish section having a downwardly depending annular flange adapted to concentrically overlie said upper cylindrical wall section of said base section, and
c. means for limiting downward slippability of an insect-trapping band fastened circumferentially around the outer cylindrical wall of said cylindrical base section.

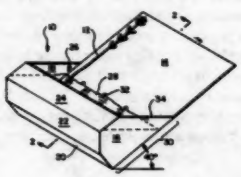
4,802,303
INSECT TRAP
John Floyd III, Acala, Fla., assignor to Fly Bye, Inc., Lexington, Ky.
Filed Feb. 29, 1988, Ser. No. 161,774
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—131 11 Claims

1. An insect trap utilizing an aromatic attractant essence comprising:
a cylindrical outer shell having an upper closed end and a lower open end;
a coaxial inner tube having first and second ends, means for attaching said first end to the inside of said closed end of said outer shell said second end of said inner tube extending through said open end of said outer shell;
said inner tube having a plurality of orifices passing through the tube walls, means for closing the second end of said inner tube;
said closing means cooperating with said inner tube so as to confine said essence;
an outer sleeve coaxial to said inner tube and spaced from said inner tube;



means on said trap to kill the flies attracted; and
means for inducing a positive draft of air through said orifices within said insect trap;
whereby said positive draft mixes said essence with inducted air creating aromatic air and releases said aromatic air into the atmosphere to attract insects.

4,802,304
CUT FLOWER STORAGE AND DISPLAY UNIT AND SYSTEM
John Ferris, 46 Arbolado Dr., La Selva Beach, Calif. 95076
Filed Nov. 5, 1986, Ser. No. 927,648
Int. Cl.[4] A01G *5/00*
U.S. Cl. 47—41 R 5 Claims



1. A container for cut flowers having stems, which comprises a generally flat bottom, a pair of sides extending from an end of said generally flat bottom at least partly along opposite sides of said generally flat bottom, a third side extending along the end of said generally flat bottom between said pair of sides, extending at a right angle to said generally flat bottom, a fourth side extending along an edge of said third side at an angle to said third side between said third side and said top, said fourth side extending vertically when said generally flat bottom is angled upward from the end at a predetermined angle, and a top extending between said pair of sides, said sides, bottom and top defining a reservoir for a liquid at the end of said flat bottom, said reservoir having an open side facing away from the end of said flat bottom, said flat bottom extending beyond said reservoir to provide support for the stems of the flowers, said reservoir serving to confine the liquid at the end of said flat bottom when said flat bottom is angled upward from the end.

4,802,305

COATED SEEDS

Susumu Kojimoto; Fumio Nii, and Toshio Mori, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 624,069, Jun. 25, 1984, abandoned. This application May 27, 1986, Ser. No. 867,595
Claims priority, application Japan, Jun. 30, 1983, 58-119814
Int. Cl.[4] A01C *1/06*
U.S. Cl. 47—57.6 7 Claims

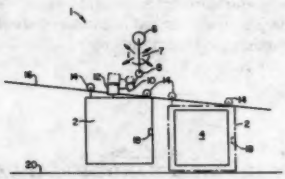
1. Multi-coated seeds having two or more coating layers, wherein at least the innermost coating layer contains a water repellent selected from the group consisting of fatty acids and metal salts thereof, said water repellent being present in said innermost coating layer in high concentration than in the other coating layer or layers.

4,802,306

AUTOMATIC, GRAVITY-POWERED CLOSURE DEVICE

Darryl E. Laxo, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 923,946, Oct. 28, 1986, which is a continuation-in-part of Ser. No. 681,526, Dec. 14, 1984, abandoned. This application Mar. 23, 1988, Ser. No. 171,984
Int. Cl.[4] E05F *15/20*
U.S. Cl. 49—31 7 Claims



1. A gravity actuated automatic closure device comprising:
a closure;
a gravity-powered means for placing said closure in front of an opening; and
triggering means for said gravity-powered means, said triggering means activated by heeling beyond an activation angle said triggering means further comprising:
(i) a release block holding said closure in an open position;
(ii) a linkage attached to said release block;
(iii) an unstable weight operably attached to said linkage, said weight capable of pulling on the linkage to release the door when an angle of heel reaches a release angle.

4,802,307

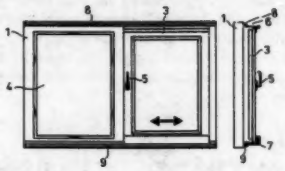
TILT-SLIDING MECHANISM FOR A WINDOW OR DOOR

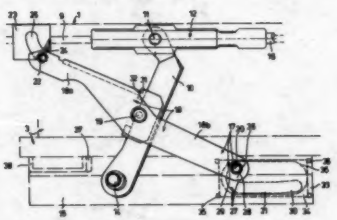
Karl H. Schmidt, Wilnsdorf-Niederdelfen, German Democratic Rep., assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,923
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711170
Int. Cl.[4] E05D *15/10*
U.S. Cl. 49—219 12 Claims

1. Tilt-slide mechanism for a wing of a window or door which can be stopped in parallel positions and in this position can be shifted horizontally relative to a stationary frame, the mechanism having lower shift arms (10) and upper shift arms, at least one of the lower shift arms (10) being pivotally mounted to a lower transverse wing beam and to a traveling carriage (12), which shift arm can be brought in and out of a work connection by a control pivot pin (22) with a thrust bearing mounted on the stationary frame by means of the displacement motion of the wing, characterized by the fact that

a supporting lever (18) has a lever arm (18) swingably hinged by a pivot pin (19) on the shift arm (10) in the area between a pivot pin (11) on the traveling carriage (12) and a pivot pin (14) on the wing, the lever arm (18) engaging a guide pin (20) so as to be swingably shiftable, the lever arm being connected to the wing in a guide slot (21)





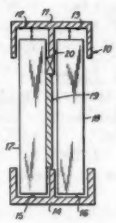
located on the wing, the guide slot being provided at one end with a detent recess (26) for the guide pin (20), while a second end of the lever arm is provided with the control pivot pin (22) which can be brought by a shift-and-lock motion of the wing into a work connection with the thrust bearing (23) mounted on the stationary frame, and said lever arm is therewith fixed so as to be placed in blocking engagement by the guide slot (21).

4,802,308

MEANS FOR PREVENTING AIR LEAKAGE THROUGH WINDOW SASH INTERLOCK

Geoffrey Hitzig, 175 Kennedy Dr., Hauppauge, N.Y. 11788

Filed Feb. 5, 1988, Ser. No. 152,861
Int. Cl.[4] E05D *15/16*
U.S. Cl. 49—406 2 Claims



1. In a window construction including a window frame, a pair of parallel horizontally sliding sash elements carried by said frame in upper and lower grooves therein for movement between open and closed positions, said sash elements being removable by raising said sash elements to enable the lower edge of said sash elements to clear a respective lower groove,

resilient means carried by at least one vertical edge of one of said sash elements to effect a seal over an elongated area in which said sash elements mutually overlap when said sash elements are in closed position; said sealing means being interrupted to form an interstice at an upper end thereof to permit removal of said sash elements, the improvement comprising: a resiliently mounted manually actuated push button having an axis of movement perpendicular to the plane of sliding movement of said sash elements, said push button being mounted in one of said sash elements and selectively retractable into said one of said sash elements; said push button in non-retracted condition filling said interstice to completely seal said elongated area.

4,802,309

METHOD AND APPARATUS FOR LAPPING AND POLISHING OPTICAL SURFACES

Erich Heynacher, Heidenheim, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

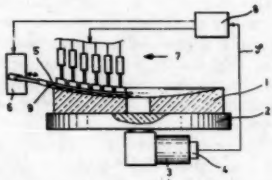
Filed Aug. 6, 1987, Ser. No. 82,292

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643914

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.[4] B24B *13/00*

U.S. Cl. 51—62 **10 Claims**



1. A method of lapping and polishing a surface of an optical workpiece, wherein the contour of the surface to be lapped or polished is first measured and the lapping or polishing process is controlled in correspondence to the deviations of the actual surface contour from a predetermined desired shape, the method comprising the steps of:

laying down upon said surface at least one lapping and polishing tool having the form of a strip-like flexible membrane covering only a portion of said surface;

applying a plurality of pressure forces to said membrane at a plurality of locations on the side of the membrane facing away from said surface to generate a pressure force distribution corresponding to said deviations, said pressure forces having respective magnitudes which vary as a function of time;

imparting an oscillatory movement to said membrane in a predetermined first direction transverse to said pressure forces so as to cause said membrane to move across said surface and to remove material from said surface;

moving said workpiece and said tool relative to each other in a predetermined second direction; and,

controlling the respective magnitudes of said pressure forces as a function of time in dependence upon the instantaneous relative position between said workpiece and said tool in said second direction of movement in order to correspond to the deviations of that portion of said surface covered by said membrane.

4,802,310

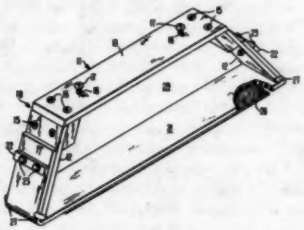
SANDER ATTACHMENT

Robert W. Holmes, P.O. Box 244, The Sea Ranch, Calif. 95497

Continuation-in-part of Ser. No. 8,477, Jan. 29, 1987, abandoned. This application Jan. 25, 1988, Ser. No. 147,539

Int. Cl.[4] B24B *23/00*

U.S. Cl. 51—170 MT **3 Claims**



1. The combination with a power sander having an oscillating base plate of an attachment for sanding curved surfaces, said attachment comprising a substantially rigid frame comprising an intermediate bar and legs depending from opposite ends of the bar, means for attaching said intermediate bar to the base plate of the sander, a stretchable elastic strap secured to said legs, said elastic strap being stretchable to move up into the space between said legs when the strap is pressed against a curved surface, and a substantially inelastic sheet of abrasive material carried by said strap, said inelastic sheet having a contact adhesive thereon which is capable of being detached from and reattached to said strap during oscillation of said frame by the sander.

4,802,311

METHOD OF GRINDING ROTARY WORKPIECES

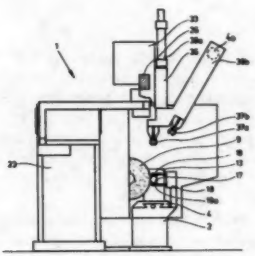
Dietmar Scheder, Leinfelden-Echterdingen, and Georg Haug, Neckartailfingen, both of Fed. Rep. of Germany, assignors to Schaudt Maschinenbau GmbH, Stuttgart (Hedelfingen), Fed. Rep. of Germany

Division of Ser. No. 767,417, Aug. 20, 1985, Pat. No. 4,651,472. This application Oct. 29, 1986, Ser. No. 924,855

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432306

Int. Cl.[4] B24B *1/00*

U.S. Cl. 51—289 R **13 Claims**



11. A method of grinding the round surfaces of rotary workpieces at a grinding station of a surface grinding machine, comprising the steps of transporting a succession of untreated and treated workpieces to and from the grinding station; monitoring the dimensions of at least some workpieces at said station including scanning such workpieces by at least one sensor of a measuring device; testing the measuring device at preselected intervals including delivering to the grinding station a

pattern having at least one defined diameter, contacting the pattern with the sensor and generating signals denoting the position of the sensor during contact with the pattern; establishing for the pattern a depository at a selected distance from the grinding station, said delivering step comprising conveying the pattern from the depository to the grinding station; and returning the pattern from the grinding station to the depository upon completion of said signal generating step, said transporting step comprising advancing untreated workpieces to and treated workpieces from the grinding station along a predetermined path a portion of which is adjacent to the depository, said testing step further including advancing a selected untreated workpiece along said path and temporarily storing the selected workpiece in the depository not earlier than upon completion of the first stage of said conveying step, withdrawing the freshly treated workpiece from the grinding station, advancing the freshly treated workpiece to the depository while the pattern is located at the grinding station, withdrawing the selected untreated workpiece from the depository, introducing the freshly treated workpiece into the depository, advancing the withdrawn selected workpiece from the depository and delivering it to the grinding station, replacing the pattern with the selected workpiece, extracting the freshly treated workpiece from the depository, reinserting the pattern into the depository, and advancing the freshly treated workpiece along said path in a direction away from the grinding station.

4,802,312

WET SAND BLASTING WITH PRESSURIZED WATER FEED

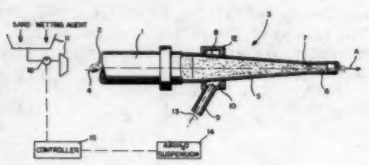
Karl C. Glaeser, and Gerhard Buhr, both of Leverkusen, Fed. Rep. of Germany, assignors to Ernst Peiniger GmbH Unternehmen für Bautenschutz, Essen, Fed. Rep. of Germany

Filed Jul. 6, 1982, Ser. No. 395,619

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1981, 3127035

Int. Cl.[4] B24C *1/00*

U.S. Cl. 51—321 **7 Claims**



1. In a method of sand blasting wherein

a stream of a suspension of a carrier gas and solid particles at superatmospheric pressure is progressively restricted in a tapering region of a conduit so that it is accelerated; and

a liquid-carrying additive gas is introduced into said stream at a location generally at the upstream end of the region and mixed with said stream to moisten said particles, the improvement wherein

said additive gas is introduced into said stream at a pressure greater than the pressure of said stream at said location by between 1.5 and 2.5 times,

said additive gas is introduced into said stream in a unit of time at a rate sufficient to introduce into said stream a quantity of the liquid equal to between about one-twentieth to one-thirtieth the mass of the particles passing said location during said unit of time, and

in another unit of time the mass of the particles of the carrier-gas stream passing the mixing location is equal to between about 1.4 to 2.5 times the mass of the carrier gas passing said location during said other unit of time.

4,802,313

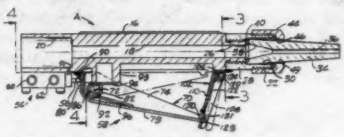
ABRASIVE BLASTING SYSTEM

Edward J. Smith, Hinckley, Ohio, assignor to ALC Co., Inc., Medina, Ohio

Division of Ser. No. 862,305, May 12, 1986, Pat. No. 4,735,021. This application Oct. 29, 1987, Ser. No. 113,992

Int. Cl.[4] B24C *5/02*

U.S. Cl. 51—438 **3 Claims**



1. A discharge nozzle and control assembly for an abrasive blasting system comprising:

an elongated body having a passage extending therethrough terminating in a discharge nozzle;

valve means carried by said body and having an operating member movable between a first position stopping the flow of abrasive fluid through said passage and a second position permitting the flow of abrasive fluid through said passage;

a first manually operable lever means mounted on the exterior of said body for pivotable movement about a first axis between a first position and a second position and biasing means for continually biasing said first lever means toward said first position, said first manually operable lever means including means for moving said valve operating member to its second position when said first manually operable lever means is moved to its second position;

a second manually operable lever means mounted on said body for pivotal movement about a second axis parallel to said first axis and spaced therefrom, and spring means for continually biasing said second lever means to a position for blocking movement of said first lever means to its said second position;

said second lever means having an opening formed through a terminal end portion spaced from said second axis;

said first lever means having a terminal end portion spaced from the first axis and adapted to extend through said opening when said first lever means is in its first position; and,

interengaging surfaces on said first and second lever means for preventing said first lever means from moving either toward or away from said second position when said first lever means is in its first position.

4,802,314

CABLE-STAY ROOF FOR STADIUM OR ARENA AND METHOD OF CONSTRUCTION OF SAME

Adam T. Schildge, Jr., 899 Green St., San Francisco, Calif. 94133

Filed Nov. 24, 1987, Ser. No. 124,969

Int. Cl.[4] E04H *3/12*

U.S. Cl. 52—6 **26 Claims**

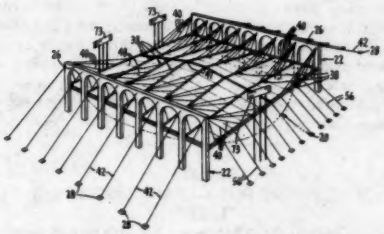
1. A methoid of contructing a roof over an existing stadium, said method comprising:

(a) erecting a first row of cable stay towers outside one side of the stadium;

(b) erecting a seocnd row of cable stay towers outside the side of the stadium opposite said one side;

(c) cantileering roof structure in compression imparting relaionship from each row of said towers by progressively extending sections of said structure from said towers and over the stadium while suspending each sucessive section

by a cable stay connection to the tower from which the section extends; and,



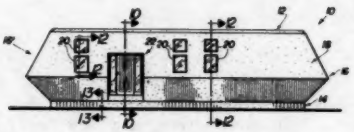
(d) joining the roof structures cantilivered from the rows of towers in tension to partially relieve compressive forces of the structures on the towers and limit such forces.

4,802,315

BUILDING CONSTRUCTION

William Reed, P.O. Box 1267, Marathon, Fla. 33050

Filed Jun. 5, 1987, Ser. No. 58,951
Int. Cl.[4] E04H 1/00
U.S. Cl. 52—79.4 **7 Claims**



1. A building system for the construction of a building usable for domestic, commercial and/or recreational purposes, said system comprising:

(a) a primary framing means for support of and at least partially defining the roof portion, side wall portions and floor portion of the building, and a secondary framing means secured to said primary framing means and disposed for formation of oppositely disposed, load-bearing end wall portions of the building,

(b) a foundation assembly disposed in supporting relation to said primary and secondary framing means and mounted on a support surface on which the building is constructed,

(c) said primary framing means comprising a plurality of primary framers disposed in spaced, parallel relation to one another and collectively extending along a length of the building,

(d) at least a majority of said plurality of primary framers each comprising a substantially continuous configuration including a roof section, a floor section and two side wall sections,

(e) said side wall sections of said primary framers collectively defining load-bearing longitudinal side walls of the building and each side wall section thereof comprising a first and a second wall segment interconnected at correspondingly positioned ends at a first junction, said first wall segments of said primary framers extending angularly outward from said roof section to said first junction and collectively defining an outwardly extending angularly oriented first side wall portion of said building, said second wall segments of said primary framers extending angularly outward from said floor section to said first junction and collectively defining an outwardly extending, angularly oriented second side wall portion of the building,

(f) said plurality of secondary framers collectively extending along both ends of the building in spaced, parallel relation to one another and in transverse relation to one of two endmost primary framers; said plurality of secondary framers extending from said roof section to said floor section of correspondingly positioned endmost ones of said primary framers, each secondary framer comprising a first and a second side wall segment interconnected at a corresponding end at a second junction,

(g) said first end wall segment extending angularly outward from said roof section to said second junction and collectively defining an outwardly extending angularly oriented first end wall portion of said building, said second end wall segments extending angularly outward from said floor section to said second junction and collectively defining an outwardly extending angularly oriented second end wall portion of the building,

(h) internal facing means for forming internal, exposed surfaces of the building being mounted on interior portions of said plurality of primary and secondary framers,

(i) external facing means for forming external portions of the building being mounted on exterior portions of said plurality of primary and secondary framers, and

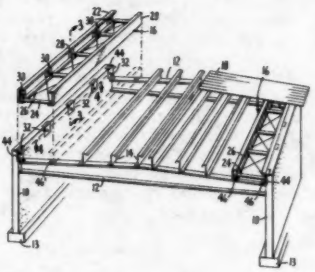
(j) each of said side wall portions and said end wall portions of the building extending outwardly from a substantially vertical orientation into a substantially V-shaped configuration along their respective lengths.

4,802,316

EAVE TRUSS AND METHOD FOR SUPPORTING AND REINFORCING A CONCRETE OR MASONRY WALL AND METAL ROOF STRUCTURE

David L. Kelly, Sacramento, and Jeffrey R. Needham, Modesto, both of Calif., assignors to The Burke Company, Sacramento, Calif. and AMCA International Corp.

Filed Jul. 28, 1987, Ser. No. 78,853
Int. Cl.[4] E04B 7/02
U.S. Cl. 52—90 **35 Claims**



1. An eave truss, for anchoring, supporting and reinforcing walls and a roof in a building resistant to seismic, wind or thermal loading, said building being constructed on a foundation and having at least two walls and a roof, with each wall having an inner side, an outer side and an upper portion and in which said roof is mounted on roof beams and purlins, said eave truss comprising:

an outer channel having two ends, a center portion, a top, a bottom, an inner surface, and an outer surface;

an inner channel having two ends, a top, a bottom, an inner surface, and an outer surface;

a first means for attaching said outer channel to said inner channel, for spacing said outer channel from said inner channel, for holding said outer channel and said inner channel substantially parallel to each other, and for supporting and reinforcing said outer channel and inner channel against each other to produce a rigid structure;

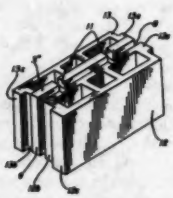
a second means for attaching the center portion of said outer channel of the eave truss against the inner side of the upper portion of the wall in shear; and,

a third means for attaching the end portions of said outer channel of the eave truss against the inner side of the wall, said third means adapted to permit movement of the ends of the outer channel relative to the wall after the end portions of the outer channel have been attached to the wall.

4,802,317
GROUND ANCHOR
David R. Chandler, Northglenn, Colo., assignor to Foresight Industries, Inc., Northglenn, Colo.
Filed Oct. 29, 1987, Ser. No. 113,828
Int. Cl.[4] E02D 5/74
U.S. Cl. 52—163 12 Claims

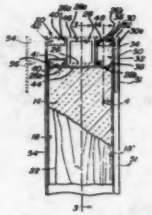
1. A ground anchor which comprises a generally rectangular rigid plate member having a tubular longitudinal central body portion, wings radiating laterally from the body portion along the length thereof, a central axial leg portion projecting from the body portion forwardly of the wings and having radiating sides with sharpened leading edges forwardly of the wings, said body portion having a raised longitudinal rib diverging rearwardly from the leg portion to an eye portion, said rib having a sharpened leading edge effective to plow earth to the sides of the body portion, said eye portion of the rib having radial shoulders in advance of the eye, a pull member pivotably mounted in the eye behind said shoulders, said tubular body portion having a socket along the length thereof with a round bottom adapted to receive a drive rod for driving the anchor into the ground, said socket having an open top with an inclined rim projecting rearwardly from the trailing ends of the wings, and said rim and said trailing and leading ends of the wings being sharp to facilitate rotation of the anchor in the ground.

4,802,318
INSULATING BLOCK UNIT, A METHOD FOR ITS MANUFACTURE, AND A METHOD OF ERECTING A WALL BY MEANS OF SUCH BLOCKS
Jacov Snitovski, 17 Bialik St., Ramat Hasharon, Israel
Filed Aug. 6, 1987, Ser. No. 83,034
Int. Cl.[4] E04B 5/04
U.S. Cl. 52—309.12 15 Claims



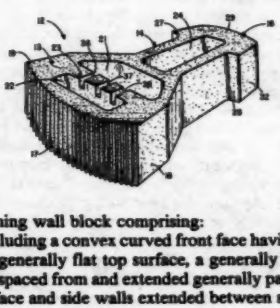
1. A hand portable and transportable insulating masonry block unit useful in conventional construction methods comprising a sandwich of an inner plate of insulating material between two conventional type building blocks, each of said building blocks defining two outer faces and at least one through-going cavity parallel to said faces, said sandwich being held together tightly and permanently by a continuous flexible strap looped through at least one through-going cavity of each of said two building blocks and encompassing said insulating material, said continuous strap remaining an integral part of said masonry block unit without protruding from the outer faces thereof.

4,802,319
PANEL STRUCTURE FOR GARAGE DOORS AND THE LIKE
Jean-Claude Lafleur, 3409 Maricourt Street-Apt. 6, Sainte-Foy, Canada G1W 2M4
Filed Aug. 18, 1987, Ser. No. 86,606
Int. Cl.[4] E06B 3/70
U.S. Cl. 52—455 9 Claims



1. A panel comprising a main panel member edgewisely carried by a quadrangular frame member, said frame member made from extruded tubular sections each having bevelled ends, one central cavity and at least two opposite first and second side cavities, the interior walls of said cavities of each tubular section being coplanar and flatly edgewisely abutting against said main panel member; wherein in each tubular section, a reinforcing tube is engaged in said central cavity and has bevelled ends, means interlocking the bevelled ends of said reinforcing tubes in pairs, corner connectors mounted in said first side cavities interlocking said tubular sections in pairs; and retaining means retaining said main panel member within said frame member.

4,802,320
RETAINING WALL BLOCK
Paul J. Forsberg, Richfield, Minn., assignor to Keystone Retaining Wall Systems, Inc., Edina, Minn.
Continuation of Ser. No. 907,077, Sep. 15, 1986, abandoned. This application Nov. 3, 1987, Ser. No. 116,228
Int. Cl.[4] E04C 1/00
U.S. Cl. 52—585 43 Claims



1. A retaining wall block comprising:
a body including a convex curved front face having opposite ends, a generally flat top surface, a generally flat bottom surface spaced from and extended generally parallel to the top surface and side walls extended between said top and

bottom surfaces rearwardly and inwardly from the opposite ends of the front face, said body having a first generally elongate pocket and a second generally elongate pocket open to the bottom surface thereof, said first pocket being located adjacent one of said side walls, said second pocket being located adjacent the other of said side walls, and a pair of holes extended vertically through said body adapted to accommodate pins having ends projected from the body said holes having opposite ends open to said top and bottom surfaces of the body one of said holes being located inwardly of and adjacent said first pocket, the other of said holes being located inwardly of and adjacent said second pocket whereby the ends of the pins projected from the body are adapted to extend into pockets of similar adjacent retaining wall blocks having front faces and locate the front faces of the adjacent retaining wall blocks offset inwardly of the front face of the retaining wall block,

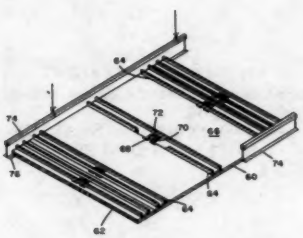
a recess open to the bottom surface of the body spaced inwardly from said convex curved front face thereof, a first opening vertically through said body spaced inwardly from said recess, a web separating said recess from said first opening, said holes being located through said web, said pockets being located adjacent opposite ends of said web, a neck joined to the side walls and extended rearwardly therefrom, said neck having a width smaller than the length of said front face, a head joined to the neck, said head having ears projected laterally from opposite sides of the neck, said neck and head having a second opening extended vertically therethrough, and a second web separating the first opening from the second opening.

4,802,321

SAG RESISTANT CEILING PANEL

Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed May 18, 1988, Ser. No. 196,180
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—484 **20 Claims**



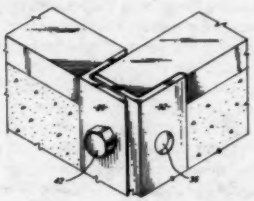
1. A ceiling panel comprising a four-sided extra-wide ceiling board, having a composition which is conductive to developing some sag when supported only along the board edges, said panel further comprising at least one narrow, elongate, rigid reinforcing element, said reinforcing element having a length substantially equal to one of the cross dimensions of said board and being affixed to extend across substantially a full cross dimension of said board, said reinforcing element having a flat rigid web portion disposed against the top face of said board, said flat web portion having an opening therein at approximately the mid point lengthwise of said reinforcing element, said opening having a shape such that a short rigid tongue is formed in said flat web portion, and means on the top face of said board, affixed to said board, in the center portion of said board, for receiving and being supported by said short tongue.

4,802,322

PORTABLE DIKE SYSTEM

Dwayne Bendfeld, Box 6, Site 6, R.R. 1, St. Albert, Alberta, Canada T8N 1M8

Filed May 21, 1987, Ser. No. 52,831
Claims priority, application Canada, Feb. 27, 1987, 530867
Int. Cl.[4] E04C 2/04
U.S. Cl. 52—601 **15 Claims**



1. An environmental control dike system, comprising:

a. a plurality of precast sections, each of said sections comprising:

i. a rectangular metal frame having a top horizontal member, a bottom horizontal member, a first vertical end member joining said top and bottom horizontal members, said first vertical end member at a first end of said frame having an extension which extends longitudinally beyond said top and bottom horizontal members, said extension having a plurality of spaced openings adapted to receive the shank of a bolt, and a second vertical end member joining said top and bottom horizontal members at a second end of said frame, said second vertical end member having a plurality of threaded openings such that one of said sections may be secured to an adjacent section by passing a bolt through said openings in said longitudinal extension at said first end of said section and threadedly engaging said bolt in said threaded opening at said second end of said adjacent section; said second vertical end member having threaded openings in both an end and a side such that each of said sections may be joined longitudinally in end to end relation with an adjacent section or joined with an adjacent section to form a corner;

ii. a plurality of vertical reinforcing bars, one end of said vertical reinforcing bars being attached to said top horizontal member and the other end of said vertical reinforcing bars being attached to said bottom horizontal member of said frame;

iii. a plurality of horizontal reinforcing bars, one end of said horizontal reinforcing bars being attached to said first vertical end member and the other end being attached to said second vertical end member of said frame;

iv. a concrete filler material covering said vertical and horizontal reinforcing bars.

4,802,323

AUTOMATED INSPECTION OF CAPSULE SEALS

Charles R. Garris, Sewell; Kenneth M. Ruttenberg, Hammonton, both of N.J., and James L. Neiswender, Sr., Philadelphia, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Oct. 20, 1987, Ser. No. 110,328
Int. Cl.[4] B65B 57/00
U.S. Cl. 53—53 **11 Claims**

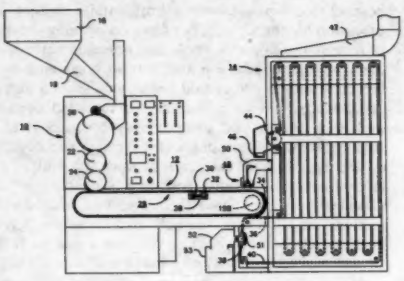
1. In combination with a machine for sealing two-part oblong capsules, each capsule having a first smaller diameter open-ended part and a second larger diameter open-ended part overlapping the smaller diameter part, the machine comprising: a first endless conveyor having a series of slats, each slat

having a row of capsule-receiving slots, the row extending in a direction transverse to the conveyor path and the slots being elongated in said direction; liquid binder applying means disposed along the path of the first conveyor for transferring liquid binder to the circumference of the capsules carried by the conveyor to form a narrow band of liquid binder at the edge of the opening of each larger diameter part; means for drying the binder on the capsules comprising a second endless conveyor having a series of capsule-carrying buckets, a drying chamber, and means for guiding the buckets through the drying chamber; means for transfer of capsules from the conveyor to the drying means; and means for removing dried capsules from the second conveyor;

an inspection and rejection apparatus comprising:

photoelectric inspection means adjacent to the portion of the first conveyor in the path between the binder applying means and the transfer means, said photoelectric inspection means comprising means for producing a defect signal upon detection of a capsule having a defective band of liquid binder;

rejection means, located adjacent to the portion of the second conveyor in the path between the transfer means and the means for removing dried capsules, for removing selected capsules from the capsule-carrying buckets of the second conveyor; and



control means responsive to defect signals produced by the photoelectric inspection means for causing the removing means to remove capsules defective bands on which caused the inspection means to produce the defect signals;

in which each capsule-carrying bucket of the second conveyor has a row of capsule-receiving recesses, and in which the means for removing selected capsules comprises a plurality of air nozzles, there being one air nozzle adjacent to the path of each recess, the nozzle being arranged to project a short-duration stream of air toward a recess as it passes the nozzle to blow a capsule out of the recess; and

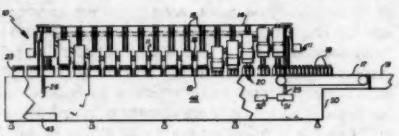
in which the second conveyor comprises a pair of conveyor chains and in which each capsule-carrying bucket is carried between the pair of conveyor chains and rotatable about a horizontal axis extending between the conveyor chains, and in which each bucket is weighted so that the openings of its recesses normally face upwardly and having guide means, located adjacent to the means for removing selected capsules, for restraining said buckets against rotation as they pass the air nozzles, whereby the air streams projected by said nozzles are prevented from causing rotation of the buckets.

4,802,324

VERTICAL CARTONING ASSEMBLY AND METHOD

William G. Everson, Deerwood, Minn., assignor to Minnesota Automation, Inc., Crosby, Minn.

Filed Apr. 14, 1988, Ser. No. 181,651
Int. Cl.[4] B65B *21/00, 5/06, 35/44*
U.S. Cl. 53—398 20 Claims



15. A process for vertically lowering partially erected and opened cartons onto moving preselected product groups comprising:

(a) providing a line conveyor for moving preselected product groups,

(b) providing a cartoner assembly having a frame, a carton transfer device, a cam rail structure having sloping sections, and a continuous supply of carton receiving baskets for engagement with said cam rail structure and for lowering cartons onto the product groups,

(c) providing a supply of flat and folded cartons for said cartoner assembly,

(d) placing individual cartons from said carton supply into the carton holders of said cartoner assembly,

(e) lowering and guiding said carton baskets onto the moving product groups,

(f) sealing the cartons beneath said product groups, and

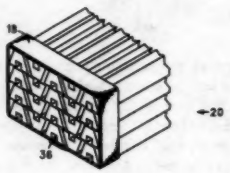
(g) removing the cartoned products from the line conveyor.

4,802,325

METHOD OF PACKAGING

William Duncan, Glasgow, United Kingdom, assignor to Motorola Inc., Schaumburg, Ill.

Filed Jul. 20, 1987, Ser. No. 75,787
Int. Cl.[4] B65B *35/50, 25/00*
U.S. Cl. 53—444 20 Claims



1. A method of packaging semiconductor integrated circuit components for shipping comprising:

loading the components in rails;

assembling a plurality of the rails into a composite self-supporting structure; and

wrapping the composite structure in an anti-static envelope so as to form a quasi-rigid anti-static package.

4,802,326

OVERLOAD COUPLING FOR PROTECTING DRIVE TRAINS ESPECIALLY ON AGRICULTURAL MACHINES

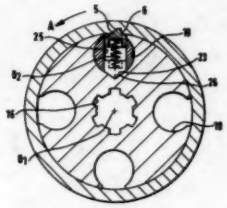
Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH

Filed Oct. 14, 1987, Ser. No. 108,732

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635163

Int. Cl.[4] A01O 75/18; F16D 7/04

U.S. Cl. 56—10.3 16 Claims



1. An overload coupling for protection against overloading of a drive train, in particular for agricultural machines, comprising a first coupling part, a second coupling part rotatably mounted to the first coupling part for relative rotation about a coupling axis, said first coupling part having a plurality of recesses therein, a rotor mounted for rotation about a rotor axis in each of said recesses, said rotor axes each being spaced from and parallel to said coupling axis, said first coupling part also having respective openings therein to said recesses for communication with said second coupling part, and a spring-loaded drive cam mounted for movement in each rotor and for engagement through said opening with said second coupling part for coupling said first and second coupling parts together.

4,802,327

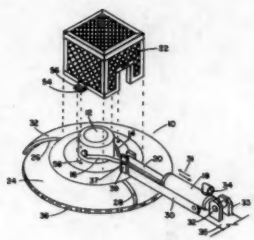
MOWER ATTACHMENT

Charles A. Roberts, Star Route, Box 24, Vian, Okla. 74962

Filed Sep. 4, 1986, Ser. No. 903,697

Int. Cl.[4] A01D 34/86; B26D 1/46

U.S. Cl. 56—15.2 10 Claims



1. A cutting apparatus which comprises:

a disc with a groove in its circumference;

a chain having cutting teeth on its outer edge and V-notches in its inner edge and positioned in said groove;

pins extending through said groove and said notches, but not through the material of said chain, to prevent excessvie slippage between said chain and said disc to provide for transfer of rotational force between said disc and the V-notch of said chain.

4,802,328

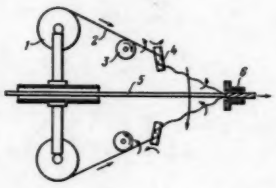
METHOD OF MANUFACTURING WIRE ROPES AND WIRE ROPE TWISTING MACHINE FOR EFFECTING THE SAME

Georgy V. Senyagin, and Anatoly V. Kazakov, both of Tashkent, U.S.S.R., assignors to Nauchno-Issledovatelsky Proektno-Konstruktorsky I Tekhnologichesky Kabelny Institut Niki Po "Sredazkabel", U.S.S.R.

Filed Feb. 25, 1987, Ser. No. 44,034

Int. Cl.[4] D07B 3/02, 3/06; H01B 13/02

U.S. Cl. 57—9 10 Claims



1. A method of manufacturing a wire rope consisting of a plurality of round steel wires helically twisted on a core wire, comprising the steps of deforming said plurality of round steel wires by applying two types of bending actions to said round steel wires which change the directions of bending including flat bending and helical bending, said round steel wires thereby being imparted with residual deformation along a helical line; and twisting said deformed round steel wires on the core wire.

9. A wire rope twisting machine for manufacturing wire ropes, comprising a successively arranged drum (10) with a core (11) wound thereon, a hollow shaft (14), a rotor (15) carrying reels (1) of wire (2) and mounted on said hollow shaft (14) through which the core (11) extends, a device (17) for imparting residual deformation to the wires (2) secured in the outlet portion of said hollow shaft (14) coaxially therewith, a reducing die (19) in which the deformed wires (2) are twisted around the core (1) and reduced, a pull mechanism (21) and a take-up drum (22) for the rope (20), wherein said device (17) for imparting residual deformation to the wires (2) comprises a body (23) having first and second successive supports (26, 27) for each wire (2) arranged therein, said first support (26) being capable of freely rotating about its geometric axis (28a), and said second support (27) being capable of freely rotating about its geometric axis (31a) and adjustingly turning about an axis (33) extending normally to the geometric axis (31a) of the second support (27).

4,802,329

COMBINED SPINDLE AND BOBBIN

Günther Oppl, Hammelburg; Hermann Pickel, Schondra-Schildeck, and Horst Rauch, Elfershausen, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer KGaA, Fed. Rep. of Germany

Filed Sep. 28, 1987, Ser. No. 101,816

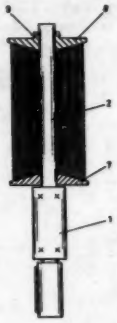
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1986, 3635338

Int. Cl.[4] B65H 75/02

U.S. Cl. 57—129 12 Claims

1. A combination spindle and spindle core for the rewinding, respooling or twisting of a yarn, wherein the spindle comprises

a rotatable spindle part and the spindle core is nonseparably supported to the rotatable part, the spindle core having an



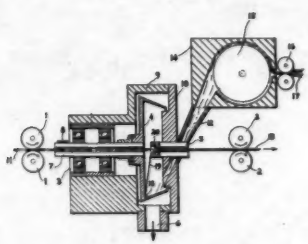
exterior that is constructed and shaped as a bobbin for directly receiving yarn thereon and for supporting yarn thereon.

4,802,330

COMBINED CARPET YARNS BY OPEN END ROTOR SPINNING

Paul W. Yngve, Wilmington, Del.; Peter Artzt, Reutlingen, Fed. Rep. of Germany; Gerhard Egbers, Reutlingen, Fed. Rep. of Germany; Ullrich Stark, Stuttgart, Fed. Rep. of Germany, and Heinz Müller, Metzingen-Neuhausen, Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 4,608, Jan. 20, 1987, Pat. No. 4,729,214.
This application Sep. 11, 1987, Ser. No. 95,224
Int. Cl.[4] D02G *3/38*
U.S. Cl. 57—238 **9 Claims**



1. A combined yarn suitable for use in carpets and upholstery having continuous filament yarn and staple yarn characterized by:

(a) the staple yarn being open end spun using suitable machine settings and having staple fibers 75–200 mm in length;

(b) a balanced ply;

(c) the combined yarn having a mechanical twist of 1.5–7 tpi; and

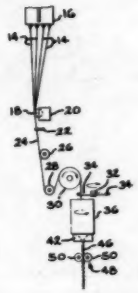
(d) the staple fibers having a denier per fiber of 6–34.

4,802,331

GLASS FIBER BULK STRAND ROVING

Jerome P. Klink, and Hellmut I. Glaser, both of Granville, Ohio, assignors to Owen-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 44,182, Apr. 30, 1987, Pat. No. 4,741,151.
This application Sep. 21, 1987, Ser. No. 98,914
Int. Cl.[4] D02G *3/18, 3/22, 3/24;* D02J *1/02*
U.S. Cl. 57—246 **13 Claims**



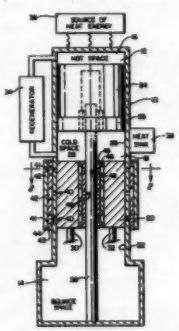
1. A bulk strand roving product comprising: a plurality of strands, each of said strands comprising a plurality of fibers, each of said strands having a plurality of axially extending loops and a plurality of unbroken, cross-axially extending loops formed therein, said axially extending loops and said cross-axially extending loops being interengaged and interwined with one another to form an entangled structure.

4,802,332

SLIDING SURFACE LUBRICATION PARTICULARLY ADVANTAGEOUS FOR A FREE PISTON STIRLING ENGINE

William T. Beale, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

Filed Nov. 20, 1987, Ser. No. 123,296
Int. Cl.[4] F02G *1/04*
U.S. Cl. 60—520 **11 Claims**



1. In an engine having opposed spaces that are each filled with fluid and have an imposed cyclic pressure difference variation, the engine further having a piston member that separates said spaces, has an outer bearing surface, and moves within and relative to a female bearing member having an interior bearing surface interfacing the bearing of the piston, a lubricating means comprising a plurality of fluid cavities opening to the interfacing bearing surfaces for the cyclic intake and

exhaust of said fluid out of phase with said imposed cyclic pressure variation.

4,802,333

THRUSTERS

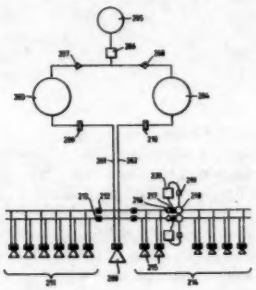
Peter Smith, Portsmouth, England, assignor to The Marconi Company Limited, England

Filed Apr. 13, 1987, Ser. No. 37,804

Claims priority, application United Kingdom, Apr. 16, 1986, 8609228

Int. Cl.[4] F02K *9/42*

U.S. Cl. 60—260 **2 Claims**



1. An attitude and orbit control thruster for use in a spacecraft having liquid bipropellant thrusters, comprising:

a combustion chamber having a thrust nozzle;

a fuel tank for containing a supply of liquid fuel;

an oxidizing agent tank for containing a supply of liquid oxidizing agent;

a pair of vaporizing chambers, each having an inlet and an outlet;

first conduit means connected between the fuel tank and the inlet of the one of the vaporizing chambers for conveying the fuel along a first path to said one vaporizing chamber for vaporization therein to form a vaporized fuel, said first conduit means being further operative for conveying the liquid fuel to said liquid bipropellant thrusters;

second conduit means connected between the oxidizing agent tank and the inlet of the other of the vaporizing chambers for separately conveying the oxidizing agent along a second path, separate from said first path, to said other vaporizing chamber for vaporization therein to form a vaporized oxidizing agent, said second conduit means being further operative for conveying the liquid oxidizing agent to said liquid bipropellant thrusters; and

means connected between the outlets of the vaporizing chambers and the combustion chamber, for delivering the vaporized fuel and the vaporized oxidizing agent to the combustion chamber for joint combustion therein to generate combustion gases for expansion through the thrust nozzle to produce thrust.

4,802,334

AUGMENTOR FUEL SYSTEM

Matthias Eder, Stuart, and Walter B. Kerr, West Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 5, 1987, Ser. No. 104,608

Int. Cl.[4] F02K *3/10*

U.S. Cl. 60—261 **5 Claims**

1. A fuel supply system for the augmentor of a gas turbine engine comprising:

fuel supply means for supplying fuel under pressure;

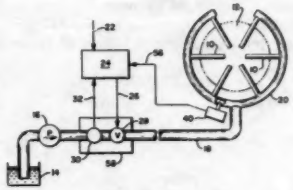
a plurality of augmentor spray bars located in the engine gas stream;

at least one manifold supplying said spray bars;

conduit means for conveying fuel from said fuel supply means to said manifold;

valve means for modulating the fuel flow quantity;

means for determining the desired fuel flow to the augmentor;



sensing means for sensing the presence of liquid, located in said supply manifold area; and

control means for providing a high fuel flow in response to the absense of liquid at said sensing means, and for providing the desired flow in response to the presence of liquid at said sensing means.

4,802,335

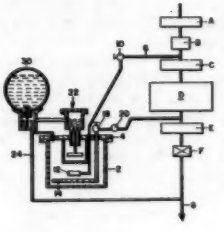
METHOD OF AND APPARATUS FOR IMPROVING THE EFFICIENCY OF INTERNAL COMBUSTION ENGINES

Howard Bidwell, Granby, Mass., assignor to Stephen Masiuk, Granby, Mass.

Continuation-in-part of Ser. No. 821,342, Jan. 22, 1986, which is a continuation-in-part of Ser. No. 623,499, Jun. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 402,970, Jul. 29, 1982, Pat. No. 4,484,444. This application Dec. 3, 1987, Ser. No. 128,387

Int. Cl.[4] F01N *3/04*; F02M *25/06*

U.S. Cl. 60—274 **12 Claims**



1. In a method of feeding magnesium powder into the air intake of an internal combustion engine including the step of variably regulating the rate of flow of the magnesium powder into the engine air intake and the step of variably regulating the rate of flow of the magnesium powder in accordance with the engine speed and load, the additional step of mixing the magnesium powder with water and agitating and heating the magnesium enriched water mixture with a flow of exhaust fumes diverted from the engine exhaust manifold and induced into the lower portion of the mixture.

4,802,336

HYDROSTATIC TRANSMISSION HAVING A CONTROL AND REGULATING DEVICE FOR ADJUSTING THE DRIVING TORQUE WITH SUPERIMPOSED OUTPUT POWER LIMIT REGULATION

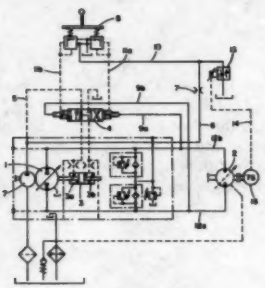
Albert Mayr, Senden, and Wolfgang Wiest, Tiefenbach, both of Fed. Rep. of Germany, assignors to Hydromatik GmbH, Ulm/Donau, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,467

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042837

Int. Cl.[4] F10H *39/46*

U.S. Cl. 60—448 8 Claims



1. A hydrostatic transmission having a control and regulating device for adjusting the driving torque with superimposed output power limit regulation, comprising:

a drive unit comprising a hydraulic pump having a variable output, and a hydraulic motor arranged to be operated by the hydraulic pump;

a servo-adjusting device arranged to control the output of the hydraulic pump in order to adjust the working pressure in the transmission, said device comprising a servo-piston arranged for two-way adjustment of the hydraulic pump in two directions, and a control valve arranged to subject the servo-piston to an adjusting pressure so that the piston can adjust the operation of the hydraulic pump;

a servo-valve spool provided in said control valve and arranged, in dependence upon the desired direction of adjustment of the hydraulic pump, to be subjected on the one hand to a control pressure and on the other hand to the working pressure prevailing in the transmission or regulating pressure proportional to the working pressure;

a variable operating device comprising a pressure regulator for adjusting said control pressure from a constant supply pressure provided by an auxiliary pump;

and a regulating valve arranged to limit the control pressure, or indirectly the supply pressure for the variable operating device, and adjustable in dependence upon the amount of working fluid running through the drive unit whereby the regulating valve operates in dependence upon the discharge amount through the drive unit only when a predetermined minimal discharge amount is reached.

4,802,337

FLAMEHOLDER FOR A TURBOJET ENGINE AFTERBURNER

Jacques E. J. Caruel, Maincy, France, assignor to Societe Nationale d-Etude et de Construction de Moteurs d-Aviation (SNECMA), Paris, France

Filed Feb. 27, 1987, Ser. No. 19,929

Claims priority, application France, Feb. 27, 1986, 86 02699

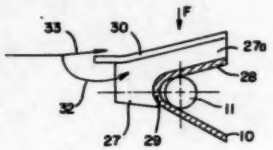
Int. Cl.[4] F02K *3/10*

U.S. Cl. 60—749 6 Claims

1. A flameholder structure for a turbojet engine afterburner having an afterburner duct to direct turbojet engine gases from an upstream portion toward a downstream portion, the flameholder structure comprising:

(a) an annular flameholder ring having a substantially "V"-shaped cross-section defined by a radially outer leg portion and a radially inner leg portion interconnected at upstream ends by a base portion such that the "V" shape opens in a downstream direction; and

(b) a plurality of substantially radially extending fins regularly distributed about the periphery of the annular flame-



holder ring and extending radially outwardly therefrom into the turbojet engine gas flow from only the radially outer leg portion of the flameholder ring, each fin having at least a downstream portion attached to the radially outer leg portion and in contact therewith along substantially its entire length, each downstream portion disposed at an angle to the direction of the gas flow so as to impart a circumferential rotation to that portion of the gas flow passing across the fins.

4,802,338

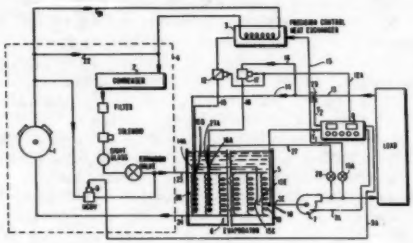
PRECISION-CONTROLLED WATER CHILLER

Philip D. Oswalt, Indianapolis; Harold R. Short, and Steven E. Wash, both of Greenwood, all of Ind., assignor to Advantage Engineering Incorporated, Greenwood, N.J.

Continuation of Ser. No. 856,033, Apr. 25, 1986, Pat. No. 4,769,998. This application Feb. 16, 1988, Ser. No. 155,764

Int. Cl.[4] F25D *17/02*

U.S. Cl. 62—98 13 Claims



1. A method of precisely controlling the temperature of a water-based liquid coolant used for cooling processing equipment in an industrial process and comprising the steps of:

circulating the process coolant through a load circuit including the processing equipment to remove heat from the processing equipment by transferring the heat from the processing equipment to the coolant;

returning process-heated coolant through a tank having refrigerant conveying and evaporating heat exchanger means of a refrigeration system therein;

sensing temperature of returning coolant from the process at a coolant return line from the equipment to the tank; and

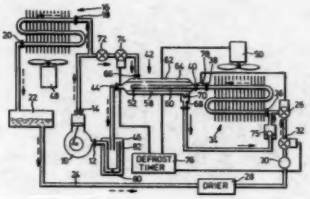
responding to sensed temperature below a desired point to transfer heat from hot gas in said refrigerating system to a portion of the coolant returned to the tank.

4,802,339

HOT GAS DEFROST SYSTEM FOR REFRIGERATION SYSTEMS AND APPARATUS THEREFOR

Charles Gregory, 1348 #5 Highway, Burlington, Ontario, Canada (L7R 3X4)

Filed Jul. 29, 1987, Ser. No. 78,950
Int. Cl.[4] F25B 47/00
U.S. Cl. 62—196.4 40 Claims



1. A liquid refrigerant vaporizer for use in a refrigeration system employing hot refrigerant fluid to defrost a coil or coils thereof, the vaporizer comprising:

first inner, second middle and third outer pipes mounted one within the other to provide a first inner flow passage in the first inner pipe, a second annular flow passage between the first inner and second middle pipes, and a third annular flow passage between the second middle and third outer pipes;

wherein the first inner pipe is adapted for connection at one end into the refrigeration system so as to receive refrigerant fluid exiting from the coil under defrost, is closed at the other end, and is provided in its wall with a plurality of bores distributed along its length so that the refrigerant fluid flowing therein exits therefrom through the bores to impinge against the inner wall of the second middle pipe for heat exchange therewith;

the total flow area provided by all of the said bores being at least 0.5 times the cross-sectional flow area of the first inner flow passage;

wherein the second middle pipe is of heat conductive material, the second annular flow passage is closed at one end and is adapted for connection at its other end into the refrigeration system for delivery of the refrigerant fluid therefrom;

wherein the cross-sectional flow area of the said second annular flow passage is at least 0.5 times the cross-sectional flow area of the first inner flow pasage;

wherein the third annular flow passage has an inlet thereto and an outlet therefrom for the hot refrigerant fluid, the inlet and the outlet being spaced from one another for the hot refrigerant fluid to contact the outer wall of the second middle pipe for heat exchange therewith; and

a refrigerant fluid flow restriction at or connected to the third annular flow passage outlet for producing an increase in back pressure of the refrigerant fluid in the second annular flow passage.

4,802,340

REFRIGERATED SALAD BAR

Thomas M. Johnson, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Oct. 28, 1987, Ser. No. 113,704
Int. Cl.[4] F25B 49/00; A47F 3/04
U.S. Cl. 62—229 8 Claims

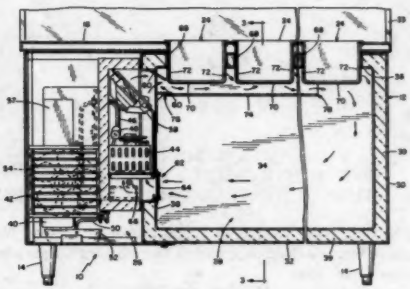
1. A refrigerated appliance for cooling foodstuffs or the like comprising an enclosure having a refrigeration unit mounted therein and an insulated storage compartment for storing foodstuffs, the improvement comprising;

said enclosure having a top wall provided with one or more openings therein communicating with said compartment, said openings adapted for receiving foodstuff containers having heat transferring bottom wall surfaces,

a cool air inlet from said refrigeration unit for providing cool air to said storage compartment,

said inlet being disposed in proximity to said top wall of said enclosure and adapted to direct cool air across the bottom wall surfaces of said containers,

a duct having one end configured to receive cool air issuing from said inlet and having a second end open to said compartment,



said compartment having a return air opening providing for the return to the refrigeration unit of air issuing from said second end of said duct,

said duct disposed in closely spaced relation to the bottom wall surfaces of said foodstuff containers, and

a baffle within said duct for diverting cool air away from one of said foodstuff containers disposed proximate to said cool air inlet,

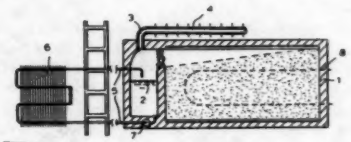
wherein said cool air is concentrated in said duct for maintaining the air within the duct at a temperature below the temperature of the compartment.

4,802,341

ADSORPTION APPARATUS TEST AS AN ELECTRO-HEATING STORAGE

Peter Maier-Laxhuber, Sammeberstrasse 14, D-8000 Munchen 60, and Fritz Kaubek, Gasparistrasse 5 A, D-8000 Munchen 71, both of Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,484
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1984, 3413349
Int. Cl.[4] F25B 27/00
U.S. Cl. 62—235.1 10 Claims



1. Adsorption apparatus for use as electro-heat storage by using the heat pumping effect, comprising:

an adsorption substance container containing an adsorption substance, said adsorption substance being capable of adsorbing water and being heatable by an electric heating system as to desorb steam from said adsorption substance;

a condenser for liquifying said steam to form a condensate;

a collecting container for collecting said condensate, said adsorption substance container being in vapor communication with said collecting container by a steam line, said condenser being in vapor communication with said collecting container so that desorbed steam from said adsorp-

tion substance can be liquified by said condenser to form said condensate and said condensate collects in said collecting container;

a heat collector for collecting ambient heat;

a water cycle connected between said collecting container and said heat collector; and

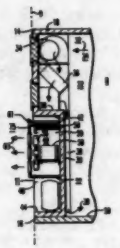
a circulation pump installed in said water cycle for circulating said condensate.

4,802,342

PROTECTIVE GRILLE AND AIR FLOW STRAIGHTENER FOR TRANSPORT REFRIGERATION APPARATUS

Alan D. Gustafson, Eden Prairie, and Richard F. Unger, New Prague, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Apr. 18, 1988, Ser. No. 182,655
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—239 **3 Claims**



1. Transport refrigeration apparatus including a condenser section containing a U-shaped refrigerant condenser coil having a horizontally oriented bight and vertically oriented leg portions which define a central fan chamber having a vertically oriented air discharge side, and a fan in the fan chamber which draws condenser air into the fan chamber through the bight and leg portions of the condenser coil, the improvement comprising:

air flow straightening means disposed across the air discharge side of the fan chamber to reduce short cycling of discharge air back into the leg portions of the condenser coil,

said air flow straightening means including a metallic grille having a major flat sheet metal portion which includes a plurality of horizontally spaced, vertically oriented louvers for straightening discharge air flow in a vertical plane,

said louvers each having upper and lower ends, and flat major portions intermediate said upper and lower ends, with said upper and lower ends being integrally joined to the major flat sheet metal portion of the grille via 90 degree twists of the joining metal which direct the flat major portions of the louvers perpendicular to the flat major sheet metal portion of the grille,

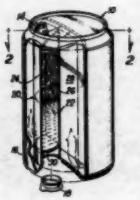
said vertically oriented louvers being horizontally spaced by a dimension selected to additionally provide the function of a protective grille.

4,802,343

SELF-COOLING CONTAINER

Arthur G. Rudick, Marietta; Richard H. Heenan, Atlanta, and Ashis S. Gupta, Marietta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Jul. 1, 1987, Ser. No. 68,876
Int. Cl.[4] F25D *3/10*
U.S. Cl. 62—294 **29 Claims**



1. A self-cooling container comprising:

(a) a hollow body for the storage of a beverage,

(b) opening means on said hollow body for providing an opening therein for dispensing said beverage therethrough,

(c) a cooling chamber within said hollow body and affixed thereto and having cooling means therein, and

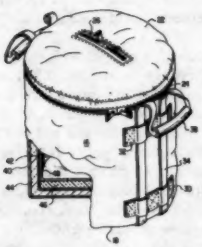
(d) a directing means within said hollow body for directing said beverage to flow into direct contact with said cooling chamber prior to being dispensed from said container.

4,802,344

PORTABLE COOLER FOR BEVERAGE KEGS

Mark L. Livingston, 58 W. 650 North, Clearfield, Utah 84015, and Michael Babcock, 1234 W. 1350 South, Syracuse, Utah 84041

Continuation of Ser. No. 69,771, Jul. 6, 1987, abandoned. This application Apr. 12, 1988, Ser. No. 183,364
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—372 **5 Claims**



1. A thermally insulated portable cooler for carrying and storing a beverage keg having a dispensing tap projecting outwardly therefrom, said cooler comprising:

a hollow cylindrical flexible outer cover member having an open top end portion, a cylindrical side wall portion, and a circular bottom wall;

a hollow cylindrical flexible inner cover member adapted to coaxially receive the beverage keg, said inner cover member having an open top end portion, a cylindrical side wall portion, and a circular bottom wall, said inner cover member being coaxially received within said outer cover member with said top end portion of said inner cover member being circumferentially secured to said open top end portion of said outer cover member, said bottom wall

and said sidewall portion of said inner cover member being respectively spaced inwardly from said bottom wall and side wall portion of said outer cover member and defining therewith an internal cavity having a hollow cylindrical side portion coaxial with said outer and inner cover member, and a lower end portion positioned between said bottom walls;

relatively flexible thermal insulating material operatively disposed within said side portion of said internal cavity;

a generally disc-shaped support member coaxially positioned in said lower end portion of said internal cavity, said support member being formed from a relatively rigid thermal insulating material and adapted to support the bottom end of a beverage keg or the like operatively received in said inner cover member;

carrying strap means, firmly secured to the outer surface of said outer cover member, for facilitating lifting and carrying of said cooler and the beverage keg disposed therein, said carrying strap means having outer end portions extending upwardly along radially opposite portions of said sidewall portion of said outer cover member, and a longitudinally central portion extending generally diametrically across said bottom wall of said outer cover member, the opposite outer ends of said carrying strap means having handle means operatively associated therewith and adapted to be grasped and lifted by a person carrying said cooler and the beverage keg disposed therein, the lifting force on said handle means being transmitted to the bottom end of the keg through said relatively rigid support member via said longitudinally central portion of said carrying strap means;

thermally insulated lid means movably secured to said top end portion for selectively opening and closing the same;

fastening means for releasably holding said lid means in a closed position; and

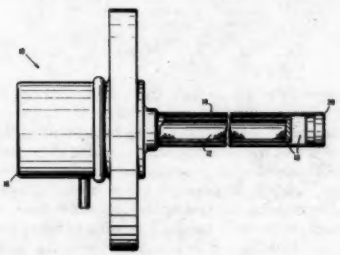
means for defining a closable opening in said cooler through which the dispensing top of the keg may outwardly project.

4,802,345

NON-TEMPERATURE CYCLING CRYOGENIC COOLER

Daniel L. Curtis, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 3, 1987, Ser. No. 128,233
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 R **7 Claims**



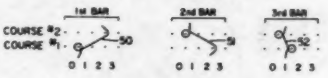
1. In a cryogenic cooler which includes a dewar spaced from a cold finger and which is arranged to operate at an operating temperature, the improvement in maintaining thermal conductivity between the cold finger and the dewar and thereby to prevent temperature cycling in the cooler, comprising a gas having the characteristic of remaining in its gaseous state at the operating temperature and, therefore, to remain in its thermally conductive state.

4,802,346

METHOD OF WARP KNITTING

Bahrat J. Gajjar, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1987, Ser. No. 135,395
Int. Cl.[4] D04B *21/00*
U.S. Cl. 66—195 **5 Claims**



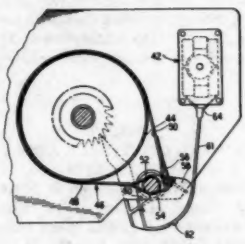
1. A method of warp knitting a plurality of threads from at least two guide bars on a warp knitting machine operating in a repeating stitch pattern which comprises the steps of: operating first guide threads in a repeating stitch pattern of alternating laid-in and knit-in stitches, while operating second guide threads in a repeating stitch pattern that is opposite to said first guide threads stitch pattern wherein when said first guide threads are laid-in, said second guide threads are knit-in, and subsequently repeating both stitch patterns.

4,802,347

PUMP MOTOR/BASKET BRAKE FOR AN AUTOMATIC WASHER

Arne M. Nystuen, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 24, 1987, Ser. No. 137,601
Int. Cl.[4] D06F *13/02, 37/40*
U.S. Cl. 68—23.7 **12 Claims**



1. For use in an automatic washer having a stationary tub, a selectively rotatable basket, a vertical oscillatable agitator, a first motor for selectively driving said agitator and said basket, a pump for discharging wash liquid from said tub, a second motor for selectively driving said pump, and a brake mechanism for selectively restraining said basket against rotational movement, said brake mechanism including a brake member selectively engageable with said basket to provide a desired braking action, means for activating said brake mechanism comprising:

means for biasing said brake member toward engagement with said basket to effect braking,

a displaceable stator portion in said second motor, and

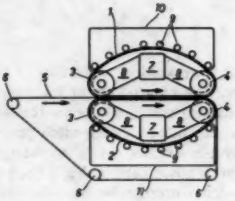
linkage means extending between said brake member and said stator portion, whereby, energization of said second motor will result in movement of said stator portion thereby moving said brake member away from engagement with said basket to release braking.

4,802,348

APPARATUS FOR TENTERING HIDES

Leena Viljanmaa, Mainaustrasse 179, Konstanz, Fed. Rep. of Germany

Continuation of Ser. No. 770,959, filed as PCT F185/00009 on Jan. 24, 1985, published as WO85/03309 on Aug. 1, 1985 abandoned. This application Sep. 10, 1987, Ser. No. 97,365
Claims priority, application Finland, Jan. 25, 1984, 840289
Int. Cl.[4] C14B *1/02*
U.S. Cl. 69—33 **12 Claims**



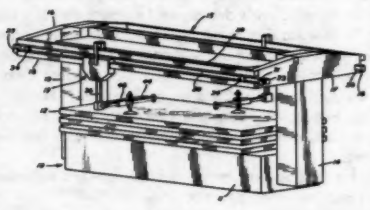
1. An apparatus for tentering a hide, said apparatus comprising first and second angular or hose-like hide tentering mats (1, 2), each open at opposite sides thereof, said mats being adapted to circulate along endless runs in predetermined directions so that a portion of the first mat is pressed in face-to-face opposing relation with and moves in the same direction as a portion of the second mat, said mats being made of an elastically extensible material, and mat stretching means for stretching both said portions of said first and second mats in a second direction crosswise to said direction, wherein the improvement comprises means for sealing (22, 23) said opposite sides of each of said first and second mats so as to respectively form closed pressure chambers or spaces, and wherein said mat stretching means comprises edge-gripping track shoes (12) attached to said mats, and guide tracks (15) for defining running paths for said track shoes, said guide tracks being adapted to simultaneously advance in said second direction and diverge from each other (1) in order to produce diverging running paths for said track shoes (12) and (2) so as to stretch said portions of said mats in said second direction crosswise relative to said direction.

4,802,349

HORIZONTAL BED POWER ASSIST HIDE APPLICATOR

Carleton E. Jennrich, Welch; Rudolph O. Marohl, Red Wing, and Robert J. Weber, Hastings, all of Minn., assignors to Sargent Sub (Delaware), Inc., Red Wing, Minn.

Filed Jul. 17, 1987, Ser. No. 74,686
Int. Cl.[4] C14B *1/02, 1/58*
U.S. Cl. 69—39 **25 Claims**



1. A power assist hide applicator apparatus for flattening and stretching a wet hide against the smooth horizontal planar surface of the flat bed of a vacuum hide drier upon which a hide is applied for subsequent drying on the bed according to conventional tannery practice, said apparatus being adapted for positioning adjacent to the bed of a vacuum drier, said apparatus comprising:

(A) an elongated horizontal arm, said arm comprising a horizontal slicker support rotatable out of and into position above and closely adjacent to the upper surface of the drier bed;

(B) support means for said horizontal arm, said support means being adapted for positioning spaced from but adjacent to the bed of a vacuum drier;

(C) a rotary connection between said support means and one end of said horizontal arm whereby said arm is rotatable in a plane parallel to and closely adjacent to the upper surface of the drier bed;

(D) means for rotating said arm relative to said support means;

(E) means supporting a slicker element from said horizontal arm, said slicker element having a smooth straight edge rotatable in a plane parallel to the surface of the drier bed;

(F) separate motor power means associated with the slicker element for rotating the same;

(G) further separate independent power thrust drive means associated with the slicker element for moving the element into and out of contact with a wet hide carried on the bed, and exerting force on the slicker element; and

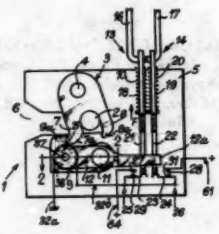
(H) electric control means for actuating the several power means for manipulating the slicker element over the surface of a hide in simulation of manual hide application.

4,802,350

ASSEMBLY OF A DOOR LATCH AND ANTI-THEFT AND ANTI-ATTACK DEACTIVATING DEVICE FOR SAID LATCH, AND LATCH WHICH IS PART OF SAID ASSEMBLY

Pierre Perieu, Cergy Pontoise, France, assignor to Rockwell-CIM, France

Filed Apr. 25, 1988, Ser. No. 185,638
Claims priority, application France, Apr. 29, 1987, 87 06131
Int. Cl.[4] E05B *53/00*
U.S. Cl. 70—264 **11 Claims**



1. An assembly of a door latch and a device for deactivating said latch, in particular for a vehicle door, in which assembly the latch comprises a keeper for fixing on a frame of the door, a latch case, a fork member pivotally mounted in the latch case in which fork member is provided an opening for receiving said keeper, said fork member being provided with two branches for retaining the keeper therebetween, a catch pivotally mounted on the latch case and capable of being placed in a position for locking the fork member onto the keeper for maintaining the door closed, means for shifting the catch and permitting the locking and unlocking of the fork member and capable of being rendered inoperative by the deactivating device, wherein:

(a) the catch shifting means comprise a control lever, at least one manual control system for said lever connected to said lever to permit the shifting of the catch for the locking of the latch, and an electromechanism capable of maintaining the control lever coupled in rotation with the catch so long as said electromechanism is not supplied with electric

current and capable of releasing the lever relative to the catch when the electromechanism is supplied with current;

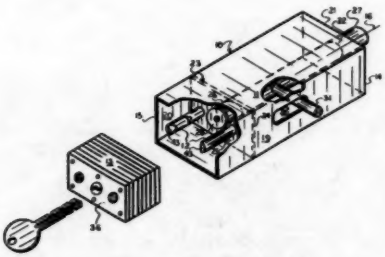
(b) the deactivating device comprises a centralized electric control circuit associated with the manual control system for the lever and in which control circuit are inserted at least one switch capable of being closed by an approach travel of said control system, and the electromechanism, which is provided with means for automatically releasing the lever relative to the catch, said means for releasing being actuated after activation of the electric deactivating circuit by a closure of said switch which supplies current to the electromechanism, and means for automatically producing said closure of said switch by a manual attempt to actuate the control system for the lever.

4,802,351

SLIDING BOLT LOCK FOR GATES

George Kojak, 2241 23rd St., Beaumont, Tex. 77706

Filed May 9, 1988, Ser. No. 191,976
Int. Cl.[4] E05B 67/38
U.S. Cl. 70—56 10 Claims



1. A lock for gate structures comprising:

(a) a sturdy metal housing elongated upon a centered axis between front and rear extremities, and comprised of opposed side panels and opposed end panels, said panels being joined in a box-like configuration having as interior of uniformly rectangular contour,

(b) a first transverse wall disposed within said housing adjacent said front extremity in perpendicular orientation to said axis and having an aperture therein centered upon said axis,

(c) a second transverse wall, bounded by opposed interior and exterior surfaces, disposed with said housing close to said rear extremity in perpendicular orientation to said axis and having an aperture therein centered upon said axis,

(d) two parallel shackle posts attached to the exterior surface of said second transverse wall at sites equidistantly spaced from said axis and extending perpendicularly therefrom to distal extremities located rearwardly of the rear extremity of the housing,

(e) bolt means having forward and rearward extremities defining a length greater than the distance of separation between said transverse walls,said bolt means being slidably held by the apertures in said walls,

(f) a manipulating arm perpendicularly attached to said bolt and extending through a close-fitting slotted opening in one of said end panels,

(g) means for limiting the extent of sliding motion of the bolt means in forward and rearward directions,

(h) a padlock configured to enter the rear extremity of said housing while engaging said shackle posts, said padlock having a rearwardly directed key-receiving extremity and an opposite, forwardly directed bottom extremity, whereby

(i) when said padlock is emplaced upon said shackle posts, the rearward extremity of said bolt means abuts against the bottom extremity of said padlock, thereby fixing the forward extremity of the bolt means in a disposition forwardly displaced from the front extremity of the housing, and

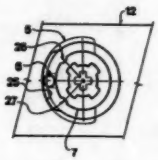
(j) when said padlock is removed, said bolt means can slide rearwardly so that its forward extremity no longer protrudes forwardly of said housing.

4,802,352

DOUBLE-THROW BAR LOCK HAVING INDEPENDENTLY OPERABLE CYLINDERS

Gian P. Andreoli, Artogne, Italy, assignor to ISEO Serrature SPA, Pisogne, Italy

Filed Jun. 8, 1987, Ser. No. 59,499
Claims priority, application Italy, Jul. 25, 1986, 21526 A/86
Int. Cl.[4] E05B 17/04
U.S. Cl. 70—118 9 Claims



1. A double-throw bar lock operable independently from opposite sides, the lock comprising an external cylinder having a tang and an internal cylinder or knob having a tang, two toothed plates and a rotatable cross element which, when rotated, transmits movement to said plates, said cross element being rotatable by an internal mechanism, provided for operation from a first side of the lock and an external mechanism, provided for operation from a second side of the lock, each of said mechanisms comprising:

a base plate or a counter-plate, respectively;

a recess provided in the base plate and in the counter-plate, said recess having a smaller diameter sector and a larger diameter sector, the sectors being smoothly joined, the larger diameter sector defining a dead region;

a rotary element rotatable within said recess, said rotary element having a raised conformation along part of an outer circumference, a seat being provided in said rotary element for entraining a cylindrical roller, the rotary element having engagement means for engaging the tangs of the external cylinder or the internal cylinder or knob;

a disc rigid with the cross element and having notches, the notches of the disc in the internal mechanism being angularly aligned with the notches of the disc in the external mechanism;

a slider; and

a pressure means for maintaining the slider in contact with the cross element;

whereby when said roller is positioned in one of said notches, the rotary element and the disc rotate together and when said roller is positioned in said dead region, the rotary element is free to rotate independently of the disc.

4,802,353

BATTERY-POWERED DOOR LOCK ASSEMBLY AND METHOD

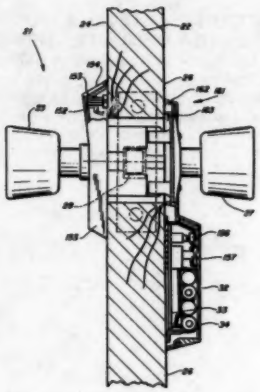
Thomas E. Corder, Danville, and James B. Mullin, San Jose, both of Calif., assignors to Intelock Corporation, Pleasanton, Calif.

Filed Aug. 7, 1987, Ser. No. 83,668
Int. Cl.[4] E05B 47/00
U.S. Cl. 70—277 26 Claims

1. In a lock assembly including movable bolt means, movable handle means coupled to move said bolt means to an open

position, and locking means mounted for movement between a locked position securing said bolt means against movement and unlocked position releasing said bolt means, wherein the improvement in said lock assembly comprises:

said locking means moving in response to movement of said handle means and normally being supported in said unlocked position;



said locking means moving to said locked position prior to movement of said bolt means to said open position upon movement of said handle means; and

electromagnetic means responsive to an input signal for energization and positioned to hold said locking means in said unlocked position upon energization thereof to prevent movement of the locking means to said locked position upon movement of said handle means.

4,802,354

HIGH SECURITY PIN TUMBLER LOCK

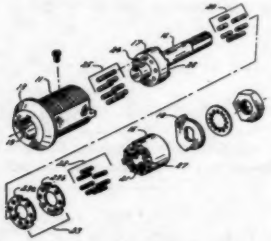
Gale Johnson, Northbrook, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Continuation-in-part of Ser. No. 3,813, Jan. 16, 1987, Pat. No. 4,716,749. This application Jul. 7, 1987, Ser. No. 70,924

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.[4] E05B *27/08*

U.S. Cl. 70—491 **14 Claims**



1. In a tubular lock construction comprising an outer barrel having forward and rear ends, a stationary tumbler sleeve telescoped into the rear end portion of said barrel, a locking spindle extending through and rotatably mounted in said stationary tumbler sleeve, a rotatable driver sleeve fixed to said spindle and disposed within said barrel in face-to-face relation with the forward end of said stationary tumbler sleeve and driver and tumbler pins slidably mounted in axially extending and angularly spaced bores defined in said stationary tumbler sleeve and said rotatable driver sleeve and normally operable to prevent rotation of said spindle with respect to said stationary tumbler sleeve, the improvement comprising

at least one of the rear face of said driver sleeve and a front face of said tumbler sleeve is provided with a plurality of notches, each notch surrounding an axial bore so as to provide a false shear plane at a trough of the notch and a support plane at the crests of said notches, said ones of said sleeves including the notched face having a relatively thin disc member fixedly mounted on the notch crests, said disc having annularly spaced bores corresponding to the tumbler and driver sleeve bores; and annular grooves defined on selected ones of said driver pins and said tumbler pins at their end proximate to the face-to-face junction of said sleeves, whereby said pin grooves interact with said sleeve notches and disc to create a false impression of the existence of said face-to-face junction, as the pins are axially slided along said annular bores.

4,802,355

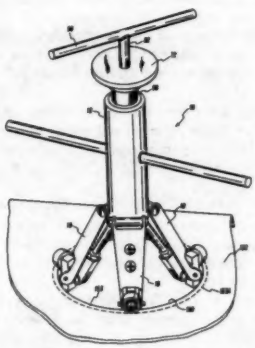
FLANGE-FORMING TOOL

Nelson Ezell, P.O. Box 1793, Breckenridge, Tex. 76024

Filed Oct. 29, 1987, Ser. No. 114,614

Int. Cl.[4] B21D *19/02*

U.S. Cl. 72—112 **20 Claims**



5. A method for forming a conical flange about a circular opening in malleable planar sheet material, comprising the steps of:

engaging an annular portion of the material which defines the opening with at least one pair of opposed surfaces on opposite sides of the annular portion;

applying rotational force to the opposed surfaces in order to initially bias the surfaces in the direction of the desired conical flange; and

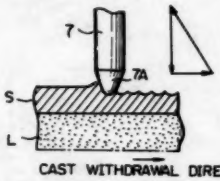
translating the opposed surfaces across the annular portion thereby displacing and deforming the annular portion to form at least a partial conical flange.

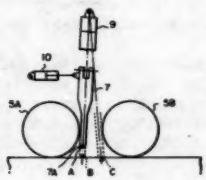
4,802,356

APPARATUS OF PROCESSING CONTINUOUSLY CAST SLABS

Tsuneo Yamada, Nishinomiya; Tsutomu Sakashita, Ibaraki; Hiroshi Tomono; Takashi Kimura, both of Osaka; Yasuhiro Maehara, and Kunio Yasumoto, both of Kobe, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Division of Ser. No. 760,453, Jul. 30, 1985, Pat. No. 4,709,572.
This application Aug. 6, 1987, Ser. No. 82,360
Claims priority, application Japan, Jul. 31, 1984, 59-161183; Aug. 20, 1984, 59-171439; Aug. 20, 1984, 59-171440
Int. Cl.[4] B21B *1/46, 11/00*; C21D *8/00*
U.S. Cl. 72—184 7 Claims





1. An apparatus for treating continuously cast slab having a surface, said slab being provided between guide rollers of a continuous casting machine, the surface of the slab passing through said guide rollers at a point after being continuously cast, comprising a working tool to form a dent in the slab surface, a first drive means to move said working tool towards and away from the slab surface, a second drive means to move said working tool alternately between a first position and a second position spaced from the first position in the direction of the passage of the slab, and a control unit connected to said first and second drive means for adjusting the movement of said working tool towards and away from the slab surface and alternately between the first and second positions.

4,802,357

APPARATUS AND METHOD OF COMPENSATING FOR SPRINGBACK IN A WORKPIECE

Everett E. Jones, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed May 28, 1987, Ser. No. 54,893
Int. Cl.[4] B21D *5/02*
U.S. Cl. 72—389 7 Claims

1. A method of bending a workpiece to a predetermined angle in a brakepress, wherein springback of the workpiece is automatically compensated for by overbending the workpiece by a calculated amount, comprising the steps of:

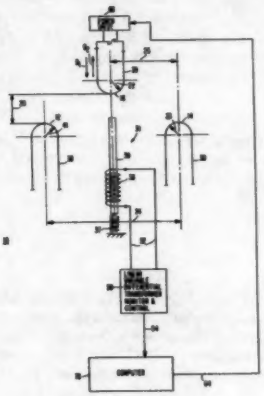
moving a punch member a selected distance in a first direction to bend the workpiece between a pair of spaced die members to a predetermined angle;

moving the punch member in a second direction, opposite the first direction to permit springback of the workpiece;

sensing when the workpiece achieves a neutral position corresponding to the cessation of springback motion in the workpiece;

determining, in response to sensing the cessation of springback motion, the distance the punch member moves in said second direction, said distance corresponding to the linear distance of springback of the workpiece;

calculating, based on said linear distance of springback and the physical geometry of the brakepress, an amount of



overbend necessary to achieve said predetermined angle of bend in the workpiece after springback; and

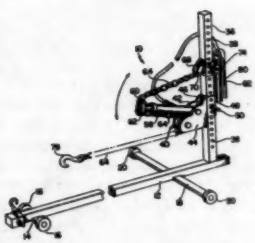
moving said punch member in the first direction a distance sufficient to overbend the workpiece by said calculated amount.

4,802,358

VEHICLE REPAIR APPARATUS

Roger Cavaca, Portsmouth, R.I., assignor to Andrew A. Bucci, Johnston, R.I., a part interest

Filed Jul. 10, 1987, Ser. No. 73,530
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—308 10 Claims



1. Apparatus for use in the repair of a vehicle, comprising an elongated horizontal beam on which rollers are mounted to provide for selected placement of said horizontal beam beneath the vehicle on which a repair is required, means located adjacent to an outermost end of said beam for anchoring said outermost end to the underside of said vehicle for securing said horizontal beam in the selected position of use, a vertical beam fixed to said horizontal beam adjacent to the end thereof that is opposite to the outermost end on which said anchoring means is located, a bracket mounted on said vertical beam in vertical adjustable relation, a pulling chain extending through said bracket and having a first end that is interconnected to said vertical beam in fixed relation, the other end of said chain being free and extending outwardly of said bracket for being located in place on a selected portion of said vehicle that has

been damaged and that is to be repaired, a main hydraulic cylinder, one end of which is mounted for pivotal movement in said bracket, a piston extending outwardly of said cylinder for axial relative movement with respect thereto, the outermost end of said piston being fixed to said chain between the ends thereof, and said piston being pivotally movable with said cylinder relative to said bracket simultaneously with the axial movement of said piston with respect to said cylinder, and portable control means for actuating said piston in said hydraulic cylinder to incrementally force said piston carried thereby are pivotally movable upwardly relative to said bracket, the outward and pivotal movement of said piston exerting an incremental pulling action on the free end of said chain for restoring the damaged portion of said vehicle on which the free end of said chain has been located to a position for finishing the repair thereof.

4,802,359

TOOL FOR MEASURING PRESSURE IN AN OIL WELL

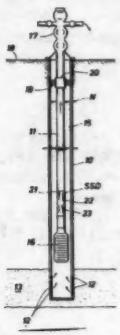
Corjon Patrice, Alkmaar, Netherlands, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 23, 1987, Ser. No. 112,905

Claims priority, application France, Oct. 30, 1986, 86 15166

Int. Cl.[4] E21B *47/00*

U.S. Cl. 73—151 **21 Claims**



1. A tool for measuring the pressure set up in an oil well by an underground formation where the well is drilled, the well being delimited by casing having production string installed therein, said string including a section comprising a sliding sleeve circulating valve, said valve being capable, on command, of putting the space inside the production string into communication with an annular space lying between the production string and the casing by bringing orifices through said sliding sleeve into register with orifices through the wall of said production string, wherein said tool comprises: means designed to be lowered inside the production string and locked at the level of the circulating valve section and further including means for putting said orifices after they have been brought into register into sealed connection with a pressure sensor, the connection being sealed against the pressure reigning in the production string, such that the pressure sensor receives the pressure reigning in the annular space via said orifices and said sealed connection means, the means for putting comprising two coaxial elements capable of sliding telescopically, a first element which is tubular and has an outside diameter which is slightly less than the inside diameter of the production string, and a second element capable of sliding over a limited stroke on an internal bearing surface of the first element and including a duct for providing sealed connection between the pressure sensor and said orifices.

4,802,360

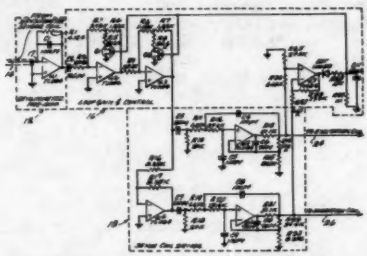
VIBRATING SPOOL DENSITOMETER IMMUNE TO CABLING EFFECTS

Lawrence C. Maier, New Haven, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Mar. 27, 1987, Ser. No. 31,850

Int. Cl.[4] G01N *9/00*

U.S. Cl. 73—32 A **19 Claims**



1. Apparatus for use with a densitometer having a probe the probe having a probe output connected to a probe output cable having a signal conductor and a shield conductor, and a probe driver coupled to said probe, comprising:

a loop circuit coupled between said probe output and said probe driver;

amplifying means, coupled in said loop circuit, for amplifying a signal provided on said signal conductor with a phase shift independent of a length or capacitance loading of said probe output cable, said amplifying means including means for holding the signal provided on said signal conductor at ground potential as a current-varying signal; and

phase/gain control means, coupled in said loop circuit between said amplifying means and said probe driver, for controlling said loop circuit to provide a loop gain of at least one and a substantially zero degree shift between said probe driver and said probe output signal.

4,802,361

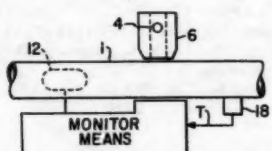
PRODUCTION STREAM ANALYZER

Alfred E. Bussian, Spring; Thomas M. Williams, Houston; Paul D. Carmichael, Houston, and Hans J. Paap, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,682

Int. Cl.[4] G01N *33/22*

U.S. Cl. 73—61.1 R **10 Claims**



1. A production stream analyzer for use with a flowing crude oil production stream which also includes water and gas in a conduit comprises:

a sensor sensing the temperature of the flowing production stream and providing a temperature signal representative thereof,

monitoring means for monitoring the capacitance of the production stream and providing a corresponding capacitance signal,

a densitometer measuring the density of the production stream and providing a density signal corresponding thereto, and

output means connected to the sensor, to the monitoring means and to the densitometer for providing output signals corresponding to the quantity of at least one constituent of the production stream in accordance with the temperature, the capacitance and the density signals.

4,802,362

FLUID FLOW SENSOR

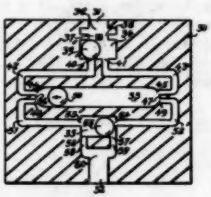
Joel E. Haynes, 18316 Oxnard St., Tarzana, Calif. 91356

Division of Ser. No. 790,595, Oct. 23, 1985, Pat. No. 4,635,476, which is a continuation of Ser. No. 589,592, Mar. 14, 1984, abandoned. This application Nov. 17, 1986, Ser. No. 914,466

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.[4] G01F *11/04*

U.S. Cl. 73—249 **4 Claims**



1. A fluid flow sensor for measuring the volumetric flow of a fluid, comprising:

a housing having a fluid inlet and a fluid outlet;

a measuring chamber in the housing having opposite first and second ends, each end being connected to both said fluid inlet and said fluid outlet;

a body in said measuring chamber movable between said opposite ends of said chamber; and

a single outlet valve means for alternatively controlling the continuous flow of fluid from said first or second end toward said outlet, said valve means including a member being movable between a first position in which said valve means member is positioned to cut-off said first end of said chamber from said outlet such that fluid in said first end of said chamber urges said body in a first direction towards the end of said chamber, and a second position in which said valve means member is positioned to cut-off said second end of said chamber from said outlet such that fluid in the second end of said chamber urges said body in the opposite direction towards the first end of said chamber;

said outlet valve means member being shaped and positioned to be moved between said first and second positions solely by the difference in fluid pressure exerted on opposite sides of the member between first and second fluids from the first and second ends, respectively, of the measuring chamber as said first and second fluids alternately flow from the ends of said measuring chamber thrugh the outlet valve means and to the fluid outlet and to be maintained in a respective one of said first and second positions, during movement of said body in said measuring chamber, solely by the difference in the pressure exerted on opposite sides of said outlet valve means member developed by the alternate flow of said first and second fluids from said respective first and second ends of said measuring chamber through said valve means and to said outlet.

4,802,363

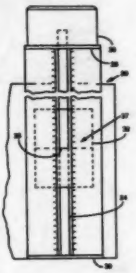
APPARATUS AND METHOD FOR MEASURING LIQUID DEPTH

John J. Fling, 57 Hollister Ranch, Gaviota, Calif. 91325, and William F. Fling, 8710 Pershing Dr., Apt. #2, Playa Del Ray, Calif. 90291

Filed Aug. 3, 1987, Ser. No. 80,808

Int. Cl.[4] G01F *23/66*

U.S. Cl. 73—315 **8 Claims**



1. A method for measuring the depth of a liquid contained in a tank or the like, comprising the steps of:

forming an elongate frame having a lower end and an upper end and a lengthwise passage extending between the upper and lower ends;

mounting a rod in the lengthwise passage in the frame;

forming a flotation device to have a passage therethrough;

mounting the flotation device on the rod so that the rod extends through the passage in the flotation device such that the flotation device may be slidably moved along the rod;

biasing the rod against rotation within the frame;

retaining the flotation device in a locked position where it is engaged with the frame to resist axial movement of the flotation device in the frame;

engaging the rod with the flotation device such that rotation of the rod within the frame causes the flotation device to rotate to an unlocked position out of engagement with the frame where the flotation device may move in the frame to the level of the liquid when the lower end of the frame is placed against the bottom of the tank; and

locking the flotation device inside the frame by allowing the flotation device to return to the locked position so that the flotation device remains at the position of the liquid level on the frame when the it is withdrawn from the liquid.

4,802,364

ANGULAR RATE SENSOR

Donald R. Cage, 6 Placer Ave., and Michael J. Zolock, 1425 Missouri Ave., both of Longmont, Colo. 80501

Filed May 29, 1987, Ser. No. 55,643

Int. Cl.[4] G01C *19/56*

U.S. Cl. 73—505 **9 Claims**

1. An apparatus for measuring rate of turn, comprising:

(A) mounting pedestal;

(B) common base mounted to said mounting pedestal;

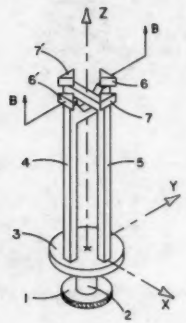
(C) tyne one substantially fixed to said common base;

(D) tyne two substantially fixed to said common base such that vibration effects with said tyne one are virtually cancelled whereas said tyne one and said tyne two act as coaxial tynes of a tuning fork whereas there is virtually no movement in said mounting pedestal;

(E) drive means associated with said tyne one and said tyne two for oscillating said tyne one and said tyne two in opposition to one another as in a tuning fork, at a selected frequency in a prescribed direction;

(F) first pickoff means for sensing relative motion of said tyne one to said tyne two whereas said first pickoff means senses a selected proportion of the motion in the driven oscillating direction as well as a selected proportion of the resultant force motion which is perpendicular to the driven oscillating direction;

(G) second pickoff means for sensing relative motion of said tyne one to said tyne two whereas said second pickoff means senses a selected proportion of the motion in the driven oscillating direction as well as a selected proportion of the motion in the resultant force direction which is perpendicular to the driven oscillating direction whereas the phase of either the said selected proportion of the motion in the resultant force direction or of said selected proportion of the motion in the driven oscillating direction is opposite to the corresponding selected proportion of said first pickoff means, for sensing any phase difference of said selected frequency related to said first pickoff means, whereas said phase difference corresponds to a measurement of rate of turn of the apparatus.

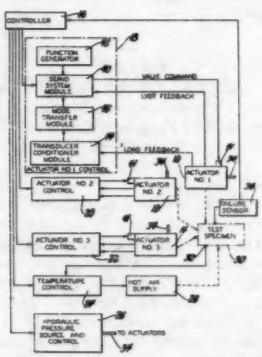


4,802,365

MULTI-AXIAL FATIGUE TESTING MACHINE

David W. Sallberg; Timothy J. Lawson, both of Farmington Hills, and Maurice H. Cardon, Rochester, all of Mich., assignors to Schenck Pegasus Corporation, Troy, Mich.

Filed Feb. 22, 1988, Ser. No. 158,605
Int. Cl.[4] G01N *3/32*
U.S. Cl. 73—808 **9 Claims**



1. A testing machine for multi-axis fatigue testing of a component having inner and outer elements subject to linear and rotational forces about different axes comprising

a base,

first, second and third hydraulic actuators secured to the base,

hydraulic pressure means and control means coupled to the actuators for controlled operation of the actuators,

gimbal means comprising first and second gimbals mounted on the base and interconnected for rotation about mutually perpendicular axes, the first gimbal having means for attachment to one of the elements,

means for substantially independently coupling the first and second actuators to the first and second gimbals respectively so that each actuator effects rocking movement of one gimbal without inputting torque about the axis of the other gimbal, and

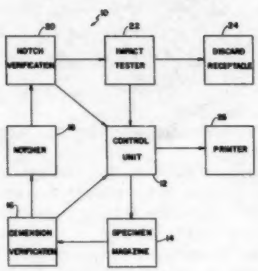
means for attaching the third actuator to the other of the elements, whereby the three actuators independently and controllably apply loads to the component about three axes of motion.

4,802,366

APPARATUS AND PROCESS FOR IMPACT TESTING OF PLASTICS

Walter F. Bachleder, Ft. Falonga; Maurice Frankel, Farmingville, and Peter Flore, Mt. Sinai, all of N.Y., assignors to Testing Machines Inc., Amityville, N.Y.

Filed May 26, 1988, Ser. No. 199,026
Int. Cl.[4] G01N *3/30*
U.S. Cl. 73—799 **17 Claims**



1. An impact tester for the impact testing of each of a plurality of specimens, said tester comprising:

vise means for selectively gripping one said specimen;

delivery means for sequentially delivering specimens to said vise means;

hammer means for selectively subjecting one said specimen gripped in said vise means to a selected impact and for measuring the impact of said hammer on the specimen;

photodetector means in proximity to said vise means for detecting and identifying a break in said specimen in response to the impact of said hammer means; and

control means operatively connected to said hammer means and said photodetector means for displaying information relating to the impact of said hammer means on said specimen and the type of break identified by said photodetector means.

4,802,367

TENSILE TEST CONTROLLER

Niel R. Petersen, Minnetonka, and David G. Chasco, Bloomington, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Continuation of Ser. No. 939,749, Dec. 9, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 147,070
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—805 **18 Claims**

1. A control system for testing specimens in tension utilizing

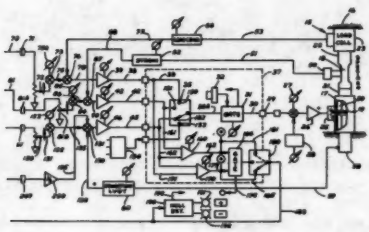
an actuator that moves to load the specimen in tension in response to servo-control signals, and including means to provide a first feedback signal proportional to the load on the specimen, and a second feedback signal proportional to the stroke position of the actuator comprising:

first circuit means including a load controller and a stroke controller, each having a separate program for providing command input signals on the basis of time, means to provide said first feedback signal to said load controller, and means to provide said second feedback signal to said stroke controller, the load and stroke controllers each providing an output signal;

second circuit means for providing a control signal to the actuator which is a function of the load controller output signal during elastic deformation of the specimen being tested, and including means for switching the control signal to the actuator to be a function of the stroke controller output signal after yield of the specimen has been reached; and

third circuit means coupled to the first circuit means for preventing increasing velocity of the actuator prior to operation of the means for switching.

10. The control system of claim 1, wherein said first circuit means includes means associated with the stroke controller that causes the output signal of the stroke controller to accelerate the actuator to cause fracture of the specimen, after the means for switching is operated to provide the control signal to the actuator to be a function of the stroke controller output signal.



15. A control system for testing specimens in tension utilizing an actuator that moves to load the specimen in response to servo-control signals comprising:

first circuit means including a load controller and a stroke controller, each being responsive to a separate program providing input signals on the basis of time, means to provide a first feedback signal to said load controller, and means to provide a second feedback to said stroke controller whereby said first circuit means provides a separate load error signal and a separate stroke error signal;

second circuit means for providing a first control signal to the actuator which is a function of the load error signal during elastic deformation of said specimen, and including means for switching to a second control signal to the actuator which is a function of the stroke error signal upon acceleration of the actuator after yield of the specimen being tested has been reached; and

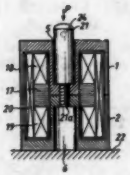
third circuit means coupled to the first circuit means and including a signal generator providing a signal representing a loading velocity for input to the stroke controller for preventing increasing velocity of the actuator beyond a desired velocity.

4,802,368

MAGNETOELASTIC FORCE TRANSDUCER

Jan O. Nordvall, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Dec. 9, 1987, Ser. No. 130,545
Claims priority, application Sweden, Dec. 15, 1986, 8605377
Int. Cl.[4] G01L 1/12
U.S. Cl. 73—862.69 7 Claims



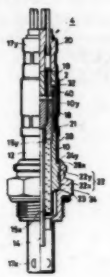
7. A magnetoelastic force transducer having a magnetic core formed from two identical, cylindrical bodies which are held together and define an axially extending and concentrically located inner space, a bobbin located in said inner space and supporting two measuring windings connected in opposition, and an excitation winding supplied with alternating current, the interior of the transducer core being shaped such that a thin cylindrical tubular wall is formed immediately opposite to the respective measuring winding in each one of said two cylindrical bodies, a stud bolt extending axially of said two cylindrical bodies and holding said two cylindrical bodies together in the vicinity of said tubular walls, whereby when the transducer is influenced, via the stud bolt, by an externally applied force, a compressive stress arises in one of said tubular walls and a tensile stress arises in the other of said tubular walls to influence the magnetic conditions in the core such that a signal is obtained from the measuring windings which is proportional to the applied force.

4,802,369

SENSOR STRUCTURE

Hiroaki Morii, Aichi, Japan, assignor to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jul. 22, 1987, Ser. No. 76,578
Claims priority, application Japan, Jul. 22, 1986, 61-172466
Int. Cl.[4] G01N 27/26
U.S. Cl. 73—116 7 Claims



1. A sensor structure comprising:

a quadrangular prism-shaped detecting element (14) made of a ceramic material;

a metal sleeve (10) having a through hole in which said ceramic detecting element is disposed;

a seal member (18–20) for closing said through hole of said metal sleeve;

a main metal tubular member (24) integrally provided with said metal sleeve in the inside thereof; and

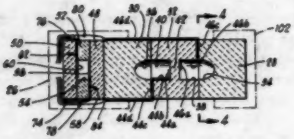
a metal outer tube (28) fixed to an outer circumferential wall of said metal sleeve, wherein an outer diameter of said metal sleeve is step-wise reduced for forming an air layer (40) between a reduced portion (10*y*) of an outer diameter of said metal sleeve and said metal outer tube.

4,802,370

TRANSDUCER AND SENSOR APPARATUS AND METHOD

Errol P. EerNisse, Salt Lake City, and Roger W. Ward, Park City, both of Utah, assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 29, 1986, Ser. No. 947,022
Int. Cl.[4] G01F *11/00*; G01L *19/04*
U.S. Cl. 73—702 **10 Claims**



5. A transducer, comprising:

a support body having a chamber which is to be exposed to a pressure to be detected when said transducer is used;

pressure sensing means, disposed in said chamber, for sensing the pressure;

reference means, disposed in said chamber, for providing a reference relative to which an output of said pressure sensing means is measured;

temperature sensing means, disposed in said chamber, for sensing temperature in said chamber; and

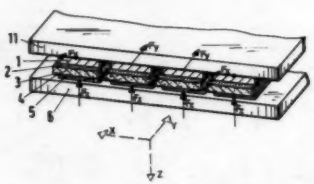
an end cap having an end wall and having a peripheral wall extending from said end wall so that a cavity is defined, said reference means and said temperature sensing means disposed in said cavity and an end of said pressure sensing means received in said cavity so that said end cap holds said reference means and said temperature sensing means next to said pressure sensing means.

4,802,371

MULTI-COMPONENT DYNAMOMETERS

Reto Calderara; Hans-Conrad Sonderegger, both of Neftenbach, and Peter Wolfer, Kleinandelfingen, all of Switzerland, assignors to Kristal Instrumente AG, Switzerland

Filed Nov. 9, 1987, Ser. No. 118,048
Int. Cl.[4] G01L *1/16, 5/16*
U.S. Cl. 73—862.04 **21 Claims**



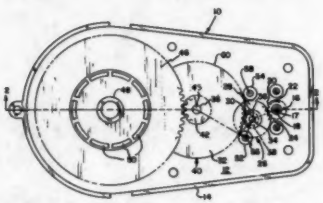
1. A multi-component dynamometer for measuring forces and torques, especially in metal-cutting operations, comprising at least one piezoelectric transducer element arranged between a pair of force introduction plates, the transducer element including at least two piezoelectric elements each having a predetermined crystallographical orientation and a flat alignment edge parallel to a crystal axis, and said two piezoelectric elements being joined to an insulating carrier plate therebetween with their flat alignment edge parallel with an alignment edge of said carrier plate whereby the piezoelectric elements are pre-oriented crystallographically in relation to a coordinate system provided by the carrier plate, and the carrier plate is oriented in relation to a coordinate system of said force introducing plates, a first piezoelectric element being sensitive to pressure in a direction essentially normal to a plane of the force introduction plates and a second piezoelectric element being sensitive to shear essentially in the plane of the force introduction plates.

4,802,372

SELECTABLE RATIO TRANSMISSION AND VISUAL IDENTIFICATION OF THE RATIO

Lawrence R. Harrod, Fort Wayne, and Michael R. Siebern, Angola, both of Ind., assignors to Kransco, San Francisco, Calif.

Filed Jun. 20, 1985, Ser. No. 747,121
Int. Cl.[4] F16H *3/02, 57/02*
U.S. Cl. 74—325 **4 Claims**



1. A selectable-ratio transmission comprising:

a driving gear rotatable on a first axis and having a first tip radius;

a driven gear having a second tip radius and rotatable on a second axis parallel to the first axis and displaced from the driving gear;

first axle-locating means defining a first intermediate axis spaced from the axis of the driving gear by a distance greater than the first tip radius and spaced from the axis of the driven gear by a distance greater than the second tip radius;

second axle-locating means defining a second intermediate axis spaced from the axis of the driving gear by a distance greater than the first tip radius and spaced from the axis of the driven gear by a distance greater than the second tip radius, the distance of the first intermediate axis from one of the first and second axes being different from the distance of the second intermediate axis from the same one of the first and second axes;

a plurality of selectable intermediate gear-set means, a selected one of which provides a selected one of a plurality of gear ratios from the driving gear to the driven gear, each of the gear-set means comprising an axle engageable with a respective one of the axle-locating means, a first gear meshable with the driving gear, and a second gear rigidly connected to the first gear and coaxial therewith and meshable with the driven gear;

each of the gear-set means being color-coded according to the respective axle-locating means with which the axle of the gear-set means is engageable;

an output gear meshing with and driven by said driven gear;

a housing enclosing the driving gear, driven gear, and a selected gear-set means;

a plurality of selectable output gear axles, each color-coded to correspond to a respective one of the gear-set means;

an opening in the housing; and

an axle support in the housing aligned with said opening and supporting a selected one of the output gear axles within the housing with the output gear axle being visible through said opening, the selected output gear axle being color-coded correspondingly to the selected gear-set means.

4,802,373

MANUAL TRANSMISSION WITH ONE PRIMARY SHAFT AND TWO SECONDARY SHAFTS

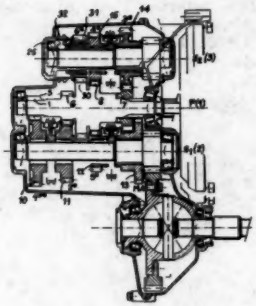
Alain Saint-Jean, Chateany-Malabry, and Michel Bagard, La Garenne-Colombes, both of France, assignors to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Oct. 24, 1986, Ser. No. 922,743

Claims priority, application France, Oct. 25, 1985, 85-15852; Oct. 17, 1986, 86-14434

Int. Cl.[4] F16H *3/08*

U.S. Cl. 74—359 **2 Claims**



1. A manual transmission comprising:

a primary shaft;

first and second secondary shafts;

first speed, second speed, fifth speed and reverse idling gears rotatably mounted on said first secondary shaft;

a first double synchronizer mounted on said first secondary shaft between said first speed idling gear and said second speed idling gear;

a second double synchronizer mounted on said first secondary shaft between said fifth speed idling gear and said reverse idling gear;

third and fourth speed idling gears rotatably mounted on said second secondary shaft;

a third double synchronizer mounted on said second secondary shaft between said third speed idling gear and said fourth speed idling gear;

a third speed gear mounted on said primary shaft and meshing with said third speed idling gear, said third speed gear being axially positioned between teeth of said reverse idling gear and said second double synchronizer;

a first drive gear mounted on said first secondary shaft and a second drive gear mounted on said second secondary shaft, and a differential ring gear meshing with both of said first and second drive gears, wherein said first and second drive gears both have identical numbers of teeth;

a fourth speed gear mounted on said primary shaft and drivingly meshing with both said fourth speed idling gear and said fifth speed idling gear;

a sixth speed idling gear rotatably mounted on an end of said second secondary shaft;

a simple synchronizer mounted at said end of said second secondary shaft;

a second speed gear mounted on said primary shaft; and

a sixth speed gear mounted on said primary shaft between said second and fourth speed gears and meshing with said sixth speed idling gear.

4,802,374

DEVICE FOR CONTROLLING THE DISPLACEMENT OF AN ELEMENT, IN PARTICULAR OF A SEAT OR PARTS OF A SEAT OF A MOTOR VEHICLE, IN RELATION TO A BASE

Renee-Louis Hamelin, Gif sur Yvette, and Maurice F. Wattier, Sissonnes, both of France, assignors to Equipments Automobiles Marchal, Issy les Moulineaux, France

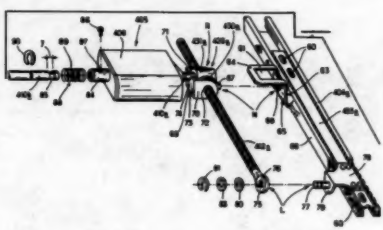
PCT No. PCT/FR86/00122, § 371 Date Feb. 5, 1987, § 102(e) Date Feb. 5, 1987, PCT Pub. No. WO86/06036, PCT Pub. Date Oct. 23, 1986

PCT Filed Apr. 14, 1986, Ser. No. 6,689

Claims priority, application France, Apr. 18, 1985, 85 05879

Int. Cl.[4] F16H *1/16*; B60N *1/02, 1/08*

U.S. Cl. 74—89.14 **13 Claims**



1. A device for controlling the displacement of an element in relation to a base comprising a motor having a shaft provided at an end with a worm, the shaft having an axis extending in a given direction,

a stirrup including two orthogonal and intersecting cylindrical sleeves defining an opening at the intersection thereof, one of said sleeves of said stirrup having a nut-wheel disposed therein, said nut-wheel having an axis of rotation that is orthogonal to the shaft axis,

said worm being housed in a tube and said motor having a casing connected to said tube, said tube having a cylindrical wall which includes a first window located adjacent said opening whereby a portion of said worm projects through said first window of said tube and said opening to engage said nut-wheel in said one sleeve, said one sleeve having open opposite ends and

the device further including a surrounding component having parallel faces disposed to close said ends of said one sleeve, said parallel faces having holes for receiving a screw which cooperates with said nut-wheel;

means for flexibly securing said stirrup relative to said base including a frame which defines a second window, said frame connected to said base and said second window receiving a portion of said stirrup so that said frame completely surrounds said portion to allow limited displacement of said stirrup relative to said base in said given direction, said stirrup and said means for securing further including conjugate connection means for preventing displacement of said stirrup relative to said base in a second direction which is mutually perpendicular to said given direction and said axis of rotation of said nut-wheel; said screw having means for detachable connection to said displaceable element including a head provided with an eye for receiving a pin connected to said displaceable element.

4,802,375

CHANGE-SPEED GEARBOX

Enno Stodt, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

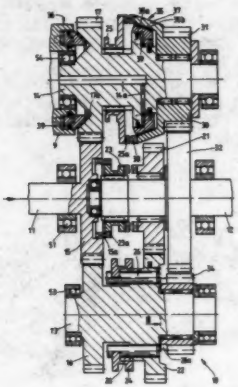
PCT No. PCT/EP86/00684, § 371 Date Aug. 3, 1987, § 102(e) Date Aug. 3, 1987, PCT Pub. No. WO87/03661, PCT Pub. Date Jun. 18, 1987

PCT Filed Nov. 26, 1986, Ser. No. 112,508

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 3543269

Int. Cl.[4] F16H *3/08*

U.S. Cl. 74—358 18 Claims



1. A change-speed gearbox for providing at least three forward gear ratios and one reverse gear ratio, the gearbox comprising:

the gearbox having a central gearbox axis, an input drive shaft on the gearbox axis for delivering input drive; an output drive shaft on the gearbox axis for being driven; a first clutch between the input drive shaft and the output drive shaft and engagement of the first clutch producing a first one of the forward gear ratios;

a first and a second counter shaft spaced from the gearbox axis and each counter shaft being rotatable independently of the output drive shaft;

a first gear wheel group including a first gear on and rotatable with the input drive shaft, a second gear on and rotatable with the first counter shaft and the first and second gears being in mesh; a third gear on and rotatable with the second counter shaft, the first and third gears being in mesh, with the second and third gear being out of mesh; the gears of the first gear wheel group all being arranged in a first gear wheel plane across the input shaft;

a fourth output gear supported on and rotatable with respect to the output drive shaft; a second clutch which is engageable for joining the output drive shaft and the fourth output gear for rotation together; a fifth output gear supported on and rotatable with the first counter shaft and in mesh with the fourth output gear for rotating therewith and for defining a second one of the forward gear ratios; the fourth and fifth gears define a second gear wheel group which are in a second gear wheel plane across the gearbox axis and axially spaced from the first gear wheel plane;

a sixth output gear is supported on and rotatable with respect to the second counter shaft; a third clutch engageable between the second counter shaft and the sixth gear for coupling them to rotate together;

a seventh gear on the output drive shaft and rotatable together therewith, the sixth and seventh gears being in mesh for rotating together and for defining a third one of the forward gear ratios;

an eighth, reversing gear in mesh with the seventh gear for rotation therewith;

a ninth, reversing gear supported on and rotatable with respect to the first counter shaft and being in mesh with the eight gear; a fourth clutch engageable for coupling the fifth gear on the first counter shaft with the ninth gear for defining the reverse gear ratio;

the sixth, seventh, eighth and ninth gears being in a third gear wheel group located in a third gear wheel plane across the gear box axis and axially spaced from the first and the second gear wheel planes.

4,802,376

VARIABLE PHASE AND OSCILLATORY DRIVES

Frederick M. Stidworthy, 2 Butlers Close, Long Compton nr. Shipston-on-Stour, Warwickshire, England (CV36 5JY)

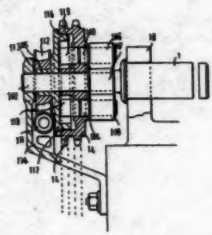
PCT No. PCT/GB86/00256, § 371 Date Feb. 27, 1987, § 102(e) Date Feb. 27, 1987, PCT Pub. No. WO86/06788, PCT Pub. Date Nov. 20, 1986

PCT Filed May 9, 1986, Ser. No. 2,693

Claims priority, application United Kingdom, May 9, 1985, 8511680

Int. Cl.[4] F01L *1/34;* F16H *35/02*

U.S. Cl. 74—394 8 Claims



1. A camshaft arrangement comprising:

a camshaft supported for rotation about a first axis;

a sprocket wheel for driving said camshaft, said sprocket wheel being supported for rotation about said first axis;

a first follower shaft mounted on said sprocket wheel for rotation therewith about said first axis, said first follower shaft being supported by said sprocket wheel for rotation about a second axis parallel to said first axis;

a second follower shaft mounted on said sprocket wheel for rotation therewith about said first axis, said second follower shaft being supported by said sprocket wheel for rotation about a third axis parallel to said first axis and located on the opposite side of said first axis from said second axis;

first and second follower members carried by said first and second follower shafts respectively for rotation with said respective first and second follower shafts;

first and second drive elements carried by said first and second follower shafts respectively for rotation with said respective first and second follower shafts, said first and second drive elements being spaced along said first axis from said first and second follower members;

coupling means carried by said camshaft for rotation therewith and engaged by said first and second drive elements to impart rotational movement to said camshaft in phase with the rotation of said sprocket wheel and in the absence of rotation of said first and second follower shafts; and

control means engaged by said first and second follower members for imparting oscillatory rotational movements to each of said first and second follower shafts in the course of rotation of said sprocket wheel to produce pulses in the rotational movement of said camshaft.

4,802,377

GANTRY ARRANGEMENT FOR AN INDUSTRIAL ROBOT

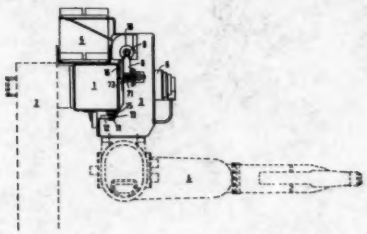
Rainer Keppler, Baiersdorf, Fed. Rep. of Germany, assignor to Manutec Gesellschaft für Automatisierungs- und Habungssysteme GmbH, Fürth, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,536

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 3532588

Int. Cl.[4] F16H *19/04, 57/12;* F16C *29/04*

U.S. Cl. 74—422 5 Claims



1. A gantry arrangement for an industrial robot, comprising:

a gantry beam defining a path of travel of the industrial robot;

support means for supporting said gantry beam;

a first elongate guide element having a circular transverse cross-section and extending parallel to said path, said elongate guide element being secured to said gantry beam and made of a rigid material, said first elongate element being disposed proximately to an upper side of said gantry beam;

a second elongate guide element having a substantially rectangular transverse cross-section and extending parallel to said path, said second elongate guide element being secured to said gantry beam and made of a rigid material, said second elongate guide element being spaced from said first elongate guide element and disposed proximately to a lower side of said gantry beam;

a carriage carrying the robot;

first means including a ball sleeve for shiftably mounting said carriage to said first elongate guide element so that said carriage is shiftably supported by said first elongate guide element for motion along said path; and

second means including at least two rollers rotatably mounted to said carriage and engaging said second elongate guide element for bracing said carriage and preventing rotation thereof about said first elongate guide element.

4,802,378

BOWDEN CABLE

Serafino Memmola, Varese, Italy, assignor to Delta Elettronica s.r.l., Varese, Italy

Continuation of Ser. No. 699,787, Feb. 8, 1985, Pat. No. 4,683,774. This application Jun. 17, 1987, Ser. No. 63,642

Claims priority, application Italy, Mar. 8, 1984, 83609 A/84; Oct. 25, 1984, 60968/84[U]; Oct. 31, 1984, 60978/84[U]

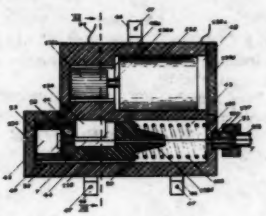
The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] F16C *1/10*

U.S. Cl. 74—502.6 18 Claims

1. A motion transmitting device, particularly for use in motor vehicles, comprising an elongated tubular casing having fixed first and second end portions; an axially movable wire extending into said casing and beyond at least one of said fixed end portions, the other end portion of said casing including a receptacle and said wire having an end portion in said receptacle; a mobile abutment disposed in said receptacle and movable with said end portion of the wire relative to said receptacle; locking means movable relative to said casing into and from motion-preventing engagement with said wire, said locking means including a blocking element movable to and from an operative position in which the blocking element prevents said mobile abutment and said wire from moving relative to said casing; and means for moving said locking means relative to said casing, said moving means including motor means and control means for said motor means.

18. A motor transmitting device, particularly for use in motor vehicles, comprising an elongated tubular casing having fixed first and second end portions; an axially movable wire extending into said casing and beyond at least one of said fixed end portions, said wire having a first end portion in the other



end portion of said casing and a second end portion; a mobile abutment reciprocable in the other end portion of said casing with the first end portion of said wire between first and second positions; means for yieldably biasing said mobile abutment to said first position; stop means provided on said first end portion of said wire, said biasing means being arranged to urge said mobile abutment against said stop means; locking means slidable in said casing into and from engagement with said wire to hold the wire against axial movement relative to the casing; actuator means for moving said wire axially, said actuator means being connected to the second end portion of said wire; and means for reciprocating said locking means relative to said casing, said reciprocating means comprising a reversible motor and control means for said motor.

4,802,379

TRANSFER MECHANISM FOR NUCLEAR REACTOR INSTRUMENTS

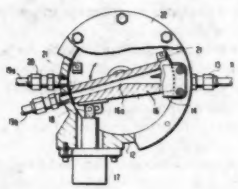
Toshikazu Edajima, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 109,787

Claims priority, application Japan, Oct. 16, 1986, 61-157382[U]

Int. Cl.[4] F16C *1/00;* G21C *19/00*

U.S. Cl. 74—502.6 5 Claims



1. A transfer mechanism for establishing an insertion/withdrawal path for a flexible monitoring cable between an inlet cable guide tube (11) and at least two outlet cable guide tubes (19*a*, 19*b*) pursuant to the measurement of variable parameters within a nuclear reactor core, comprising:

(a) a hollow cylindrical housing (12) having an inlet aperture in a sidewall thereof and at least two spaced outlet apertures in a generally diametrically opposite sidewall,

(b) coupling means (13, 20) for individually connecting the inlet and outlet tubes to the inlet and outlet apertures in axial alignment therewith,

(c) a selector member (16) rotatably mounted within the housing and having a branched guide passage (16a) defined therein and extending therethrough, said passage having a single outlet disposed proximate said outlet apertures and at least two inlets disposed proximate said inlet aperture, and

(d) actuator means (17) operatively coupled to the selector member for selectively rotating said member between at least two stop positions whereat a continuous cable insertion/withdrawal path is established between the inlet tube and either one of the outlet tubes.

4,802,380

HANDLE CONTROL FOR A SLOT MACHINE

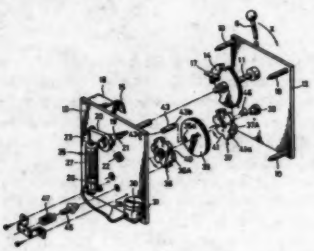
Masaharu Shirasawa, Tochigi, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Aug. 31, 1987, Ser. No. 91,498

Claims priority, application Japan, Aug. 29, 1986, 61-203449

Int. Cl.[4] G05G *1/04*; F16D *41/04*

U.S. Cl. 74—523 **3 Claims**



1. An operating handle control device in combination with a slot machine having an operating handle which is swung from its initial position to a starting position for starting a game, the operating control device comprising:

a rotatable wheel supported by a fixed shaft for rotation by said operating handle;

a pair of clutch wheels mounted on said fixed shaft on opposite sides of said rotatable wheel, said clutch wheels being rotatable unidirectionally but oppositely to each other;

longitudinally displaceable interconnecting means for selectively interconnecting said rotatable wheel with one of said pair of clutch wheels; and

actuating means for moving said interconnecting means in opposite directions when said operating handle is swung to said initial position and to said starting position, thereby causing said interconnecting means to perform said selective interconnection.

2. An operating handle control device for a slot machine having an operating handle which is swung from its initial position to a starting position for starting a game, the operating handle control device comprising:

a rotatable wheel supported by a fixed shaft for rotation by said operating handle;

a pair of clutch wheels mounted on said fixed shaft on opposite sides of said rotatable wheel, said clutch wheels being rotatable unidirectionally but oppositely to each other;

interconnecting means for selectively interconnecting said rotatable wheel with one of said pair of clutch wheels, said interconnecting means comprising a pin slidable lengthwise in a bore in said rotatable wheel; and

actuating means for moving said pin in opposite directions when said operating handle is swung to said initial position and to said starting position, thereby causing said pin to perform said selective interconnection.

4,802,381

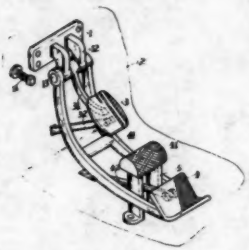
COMPOUND ACCELERATION-BRAKE PEDAL ASSEMBLY

Nsin-Hsin Lo, 9, Alley 3, Lane 35, Weitao Rd. No. Dis., Taichung, Taiwan

Filed Mar. 18, 1987, Ser. No. 27,358

Int. Cl.[4] G05G *1/14, 1/18*

U.S. Cl. 74—513 **3 Claims**



1. A compound acceleration-brake pedal for vehicles consisting essentially of the following engaging and interacting elements: a brake pedal means for initiating braking action, said brake pedal means having parallel upwardly arms, each arm having an upper end with an opening defining an axis of rotation, and a lower end connected to a brake pedal;

an axle means inserted through said opening;

an accelerator pedal assembly rotatably mounted on said axle means and including a pendant-type acceleration pedal;

an accelerator linkage means connected to said accelerator pedal assembly for connecting said pedal assembly to fuel regulating apparatus in the vehicle;

a brake bar means for operatively connecting said brake pedal to a braking mechanism in the vehicle;

a foot stock separately and fixedly disposed between said arms and in spaced relationship between said accelerator pedal, and said brake pedal, said foot stock having a sloping surface being aligned with respective surfaces of said accelerator pedal and said brake pedal.

2. A compound accelerator-brake pedal structure for a vehicle comprising a pendant-type accelerator assembly including a pivot arm and an accelerator pedal, a pendant-type brake assembly including a pivot frame and a brake pedal, the pivot arm and the pivot frame being suspended from a common axle with the accelerator pedal being located above and in line with the brake pedal, and a fixed foot stock between the pedals, the foot stock being positioned for supporting a user's foot in a location for selectively operating the accelerator and brake pedals, with toe pressure and heel pressure respectively by rocking the foot on the foot stock.

4,802,382

CONNECTING ROD ASSEMBLIES INTENDED FOR THE RECIPROCATING DRIVING OF A PISTON INSIDE A CYLINDER

Robert Nissels, Vallières, France, assignor to Société Berthoud S.A., Belleville sur Saone, France

Filed Jun. 19, 1987, Ser. No. 64,132

Claims priority, application France, Jun. 26, 1986, 86 09483

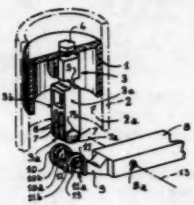
Int. Cl.[4] G05G *1/00*; F16J *1/04*

U.S. Cl. 74—579 R **8 Claims**

1. A connecting rod assembly for reciprocating a piston within a cylinder comprising, a connecting rod having upper and lower ends which are integrally formed with respect to one another along an elongated axis, said connecting rod having an area of reduced dimension spaced from said upper end thereof, said area of reduced dimension being yieldable so as to permit said lower end of said connecting rod to be positioned

in various orientations with respect to said upper end, said lower end of said connecting rod including a plurality of blade elements which are spaced relative to one another and which extend generally parallel to said elongated axis of the connecting rod, each of said blade elements having a curved lower bearing surface portion, said blade elements being yieldably resilient so as to be urged toward one another and thereafter being capable of assuming their original configuration, an actuating lever, said actuating lever having an end portion, and means for cooperatively seating said curved lower bearing surface portions of said blade elements of said connecting rod with said end portion of said lever, and connector means carried by said blade elements for cooperatively engaging said end portion of said actuating lever.

5. A combination piston and connecting rod assembly for reciprocating the piston within a cylinder comprising, a piston



means, a connecting rod having upper and lower ends which are integrally formed with respect to one another, means for securing said upper end of said connecting rod in fixed relationship with respect to said piston means, said connecting rod having an area of reduced dimension spaced from said upper end thereof, said area of reduced dimension being yieldable so as to permit said lower end of said connecting rod to be positioned in various orientations with respect to said upper end, an actuating lever, said actuating lever having an end portion, said lower end of said connecting rod including a plurality of blade means which are spaced and generally parallel relative to one another, said blade elements being yieldably resilient so as to be urged toward one another and thereafter being capable of assuming their original configuration, and connector means carried by at least two of said blade elements for cooperatively engaging said end portion of said actuating lever.

4,802,383

POWER TRANSFER DEVICE FOR FOUR-WHEEL DRIVE

Nobuaki Katayama; Kan Sasaki; Takeharu Koide, and Keisuke Takimura, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 22, 1987, Ser. No. 53,061

Claims priority, application Japan, May 23, 1986, 61-119650; Mar. 2, 1987, 62-47260

Int. Cl.[4] F16H *1/44*

U.S. Cl. 74—711 **6 Claims**

1. A power transfer device for four-wheel drive in combination with a power transmission, comprising:

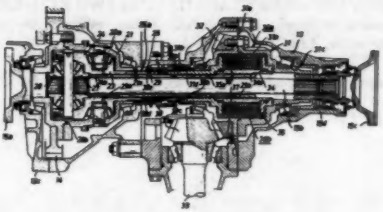
a first differential of the bevel gear type arranged to split the driving torque from said power transmission into two torque delivery paths respectively for front-wheel drive and rear-wheel drive;

a second differential of the bevel gear type arranged coaxially with said first differential at one side thereof to transfer the split driving torque from a first side gear of said first differential to one of front and rear-wheel axles;

an output gear arranged coaxially with said first differential at the other side thereof to transfer the split driving torque from a second side gear of said first differential to the other of said rear and front-wheel axles; and

a limited-slip differential assembled within a mounting case for said output gear to effect limited-slip torque proportional to the difference in rotational speed between said side gears;

wherein said limited-slip differential includes first and second rotary elements coupled with each other for relative rotation, said first rotary element being assembled within said mounting case for relative rotation and having a hollow shaft portion aligned with a first hollow shaft which is drivingly connected to the second side gear of said first differential, and said second rotary element being mounted on a second hollow shaft which is drivingly connected at an inner end thereof to the first side gear of said first differential and extends into the interior of said mounting case through said first hollow shaft, and



a clutch sleeve arranged between said first differential and said output gear and axially slidably mounted on said first hollow shaft for rotation therewith and being shiftable between a first position where it is engaged with said mounting case and said hollow shaft portion of said first rotary element and a second position where it is disengaged from said mounting case and said hollow shaft portion of said first rotary element and engaged with a casing of said first differential, whereby said power transfer device may be switched between limited slip four wheel drive when said clutch sleeve is in said first position, and two wheel drive when said clutch sleeve is in said second position.

4,802,384

PROCEDURE FOR SHIFTING A TRANSMISSION COMPOSED OF SEVERAL GEAR UNITS

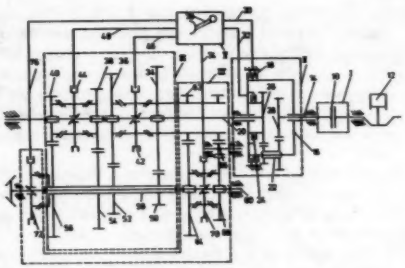
Reinhard Schwarz, Gondelsheim; Heinz Stuhrmann, Schwetzingen, and Dieter Nobis, Lousee-Halzhausen, all of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Sep. 30, 1987, Ser. No. 103,481

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633372

Int. Cl.[4] F16H *3/02*; B60K *20/10*

U.S. Cl. 74—745 **3 Claims**



1. A process for shifting a transmission having:

(i) a first gear unit drivably connectible to an engine;

(ii) a last gear unit having at least one synchronizer to driv-

ingly connect the last gear unit to at least one driven component;

(iii) at least one intermediate gear unit releasably connecting said first and last gear units,

the process comprising:

(i) releasing said at least one synchronizer and said at least one intermediate gear unit;

(ii) connecting said at least one synchronizer;

(iii) connecting said at least one intermediate gear unit.

4,802,385

AUTOMATIC TRANSMISSION'S RAVIGNEAUX TYPE PLANETARY GEAR TRAIN HAVING TWO RING GEARS

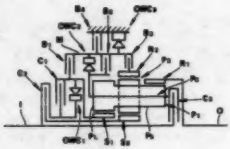
Kazuyoshi Hiraiwa, Hamamatsu, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 10, 1986, Ser. No. 917,896

Claims priority, application Japan, Oct. 11, 1985, 60-224780

Int. Cl.[4] F16H *57/10*

U.S. Cl. 74—758 **10 Claims**



1. A planetary gear system comprising:

a stationary member,

input means for receiving a driving torque,

an output shaft,

a compound planetary gear train comprising a plurality of pinion sets each comprising a first pinion and a second pinion meshing with each other, a pinion carrier supporting said first and second pinions, a first sun gear meshing with said first pinions, a first ring gear meshing with said first pinions and always connected with said output shaft, a second sun gear meshing with said second pinions, and a second ring gear meshing with said second pinions,

a clutch group including a first clutch disposed between said input means and said first sun gear for connection and disconnection therebetween, a second clutch disposed between said input means and said second sun gear for connection and disconnection therebetween, and a third clutch disposed between said input means and said pinion carrier for connection and disconnection therebetween, and

a holding device group including a first holding device disposed between said first sun gear and said stationary member for holding said first sun gear, a second holding device disposed between said pinion carrier and said stationary member for holding said pinion carrier, and a third holding device disposed between said second ring gear and said stationary member for holding said second ring gear,

wherein each of said first pinions has a large gear section having a diameter and a small gear section which rotates with said large gear section as a unit and which has a diameter smaller than said diameter of said large gear section, said large gear section of each of said first pinions being in mesh with said first sun gear, and said small gear section of each of said first pinions being in mesh with said first ring gear, and wherein, in each pinion set, said second pinion is in mesh with said small gear section of said first pinion.

4,802,386

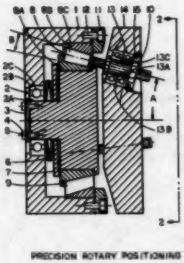
PRECISION ROTARY POSITIONING MECHANISM

August F. Haack, 3813 Don Juan Ct., NW, Albuquerque, N. Mex. 87107

Filed Feb. 18, 1987, Ser. No. 16,174

Int. Cl.[4] F16H *13/06, 15/56, 57/10, 13/02*

U.S. Cl. 74—798 **1 Claim**



PRECISION ROTARY POSITIONING MECHANISM

1. A rotary positioning apparatus comprising:

a. a carrier having a central axis;

b. a plurality of roller/shafts whose axes are oblique to the axis of the carrier;

c. bearing means rotatably mounting a first end of each roller/shaft in the carrier;

d. housing means;

e. a central shaft member rotatably mounted within the housing means;

f. wherein the second end of each roller/shaft is tapered and mounted between the central shaft and housing by an inner race and an outer race;

g. biasing means positioned within the housing means to bias the housing and central shaft so that the races are biased against the tapered ends of the roller/shafts;

h. whereby a rotational input to the device is provided at the first end of one of said roller/shafts;

i. whereby a rotational output member may be the central shaft, the housing, or the carrier, when one of the three is held stationary, and a device to be positioned is affixed to the output member by an attachment means.

4,802,387

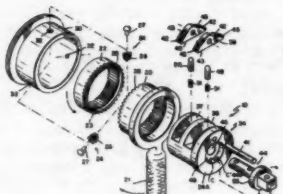
REVERSIBLE UNIDIRECTIONAL TRANSMISSION

Thomas A. Williams, III, 4768 S. 6th St., Arlington, Va. 22204

Filed Nov. 24, 1986, Ser. No. 934,102

Int. Cl.[4] E16H *5/52*; B25B *17/00*

U.S. Cl. 74—812 **27 Claims**



1. A transmission comprising:

an output member;

first means rotating in a first direction for driving said output member in a first direction in response to a first direction of rotation of said input member, said first means rotating in a second direction and not driving said output member in response to a second direction of rotation of said input member;

second means rotating in a first direction for driving said output member in said first direction in response to the second direction of rotation of said input member, said second means rotating in a second direction and not driving said output member in response to the first direction of rotation of said input member;

third means for changing the rotation of said output member to a second direction by changing said first means to rotate in said second direction for driving said output member in said second direction in response to said second direction of rotation of said input member and said first means to rotate in said first direction and not driving said output member in response to the first direction of rotation of said input member, and by changing said second means to rotate in said second direction for driving said output member in said second direction in response to said first direction of rotation of said input member and said second means to rotate in said first direction and not driving said output member in response to the second direction of rotation of said input member;

intermediate means for rotating said first means in said first direction and rotating said second means in said second direction in response to said first direction of rotation of said input member, and for rotating said first means in said second direction and said second means in said first direction in response to said second direction of rotation of said input member; and

holding means for enabling said intermediate means to cause said second means to be rotated by said input member in the opposite rotational direction of said input member and for disabling said intermediate means thereby not causing said second means to be rotated by said input member in the opposite rotational direction of said input member.

4,802,388

TIRE REPAIR PLUG AND TOOL

Simon Roberts, 30543 Shoreham, Southfield, Mich. 48076

Division of Ser. No. 592,506, Mar. 26, 1984, Pat. No. 4,579,161. This application Jul. 22, 1985, Ser. No. 757,257

Int. Cl.[4] B60C *25/16, 21/06*

U.S. Cl. 81—15.7 **6 Claims**

1. In a tire repair apparatus for repairing and sealing a puncture of a tire of the type wherein a resilient plug is forcibly inserted into said puncture the improvement comprising:

(a) a labyrinth of closely spaced arcuate sealing rings with concentric circumferential grooves therebetween axially disposed along the periphery of the plug; and

(b) a folded metal wire insert having contiguous straight segment portions interiorally bonded to the plug and an adjoining loop portion projecting outwardly from one end of the plug for receiving a hook end portion of a tool adapted to forcibly insert the plug into a puncture of a tire.

4,802,389

ADJUSTABLE WORKPIECE GRIPPING AND ROTATING DEVICE

William E. Shultz, 239 N. Main St., Lombard, Ill. 60148

Continuation of Ser. No. 463,858, Feb. 4, 1983, abandoned. This application Dec. 31, 1984, Ser. No. 687,659

Int. Cl.[4] B25B *13/12*

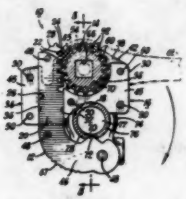
U.S. Cl. 81—127 **6 Claims**

1. Apparatus for gripping and rotating a workpiece comprising:

a gear mechanism housing having therein a rotatable annular gar member rotatably secured within the housing, said gear member including a plurality of radially extending teeth extending from an integral axle said axle including integral bearing surfaces on opposite ends, said gear member axle including a torque member-receiving slot extending completely through the axle and the housing to permit a torque member to engage the gear member axle from opposite sides of the housing;

a first adjustable jaw member including an integral elongated rack having a plurality of teeth cooperatively spaced to be received between the teeth of the annulsr gear member, said rack received and movable within a rack-receiving slot in the gear mechanism housing, said rack-receiving slot extending completely through the gear mechanism housing so that the adjustable jaw member can be manually forced to achieve more or less jaw separation, said slot defined by spaced inner housing wall members to maintain said gear member in alignment with said rack to maintain interengagement of the teeth of the rack with the teeth of the gear member;

a second jaw member integral with the gear mechanism housing, cooperatively disposed with respect to the adjustable jaw member for gripping a workpiece therebetween;



friction means disposed between said gear member and said gear member housing for frictionally engaging said gear member to provide a predetermined rotational resistance to said gear member at all rotational positions of said gear member, so that the adjustable jaw member and gear member are manually movable to manually initially set and maintain the adjustable jaw member with respect to the second jaw member onto a workpiece to any approximate, predetermined desired spacing without further movement or slippage of said adjustable jaw member from said predetermined initial spacing.

4,802,390

AUTO-GRIP PLIERS

William A. Warbelt, 121 Iroquois Dr., Butler, Pa. 16001

Continuation of Ser. No. 777,358, Sep. 18, 1985, Pat. No. 4,662,252. This application Mar. 19, 1987, Ser. No. 28,188

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[4] B25B *7/04*

U.S. Cl. 81—341 **4 Claims**

1. Pliers having first and second rigid elongated handle members, each having a jaw end, a handle end, and an intermediate neck portion;

fastening means connecting the members between their neck portions and permitting the jaw ends to move toward each other in a sliding action in response to an initial manual closing force being applied to close the handle ends toward each other to grasp a workpiece between the jaw ends;

the fastening means acting to half further sliding action of the members in response to the jaw ends contacting the workpiece and to translate continued closing force on the handle members as a pivoting, gripping action of the jaw ends on the workpiece; and

a spring, mounted fully within the first handle member and

interconnected to the second handle member, exerting force on the second handle member such that the jaw ends

are normally caused to slide away from each other to a fully opened disposition.

4,802,391

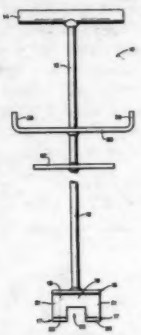
TOOL FOR RECREATIONAL VEHICLE

Stanley K. Willhoite, and Thomas G. McMennamy, both of Rte. 1, Box 188A, Temple, Tex. 76501

Filed Sep. 24, 1987, Ser. No. 100,475

Int. Cl.[4] B25B *33/00*

U.S. Cl. 81—488 **11 Claims**



1. A hand tool for use to assist in connecting and operating the sewer hose and sewer gate valve of a recreational vehicle, comprising:

an elongated rod having a handle at one end and a two prong hook at the other end; an upright wall member mounted on said rod adjacent to and facing said hook; and a cross bar member secured to said rod at a position intermediate said ends, said cross bar member having a flange at each end which extends generally parallel to said rod.

4,802,392

METHOD OF EXTRACTING THE WOOD DUST COLLECTING IN VERTICAL PANEL SAWS

Ludwig Striebig, Lucerne, Switzerland, assignor to Striebig AG, Switzerland

Filed Apr. 24, 1987, Ser. No. 41,938

Claims priority, application Switzerland, Apr. 25, 1986, 1702/86

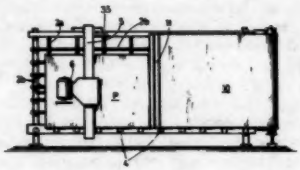
Int. Cl.[4] B26D *7/18, 1/18*

U.S. Cl. 83—100 **8 Claims**

1. A vertical panel saw comprising means for collecting sawdust accumulating behind a panel when the saw is making horizontal cuts therein, comprising a substantially vertical supporting grid on which a panel to be sawed is placed, said grid being formed from horizontally arranged, mutually parallel bars and on a front panel support side of which is arranged a vertical, laterally displaceable beam supporting a saw unit, said panel saw further comprising

a rear side of the supporting grid, which rear side is remote from the panel support side and is completely closed by a cover element anchored in a stationary manner on the supporting grid,

channels thereby formed between the grid bars adjacent to one another in pairs and connected to a vertical flow-off shaft,



a movable sealing wall extending over the entire supporting grid height and arranged on the marginal section of the supporting grid which lies in the direction of the horizontal cut, said sealing wall being pretensioned in the direction of the panel to be sawed, and coupling means cooperative between said beam and a free edge of the sealing wall to cause joint lateral movement of said beam and sealing wall, said free edge of the sealing wall normally resting against an edge of said panel, said coupling means interengaging said free edge of the sealing wall and said beam in order to prohibit said saw from engaging said free edge of said sealing wall.

4,802,393

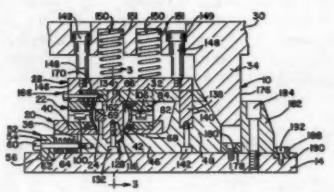
PIERCING DIE

Henry Gruchalski, and Albert Gruchalski, both of Bensenville, Ill., assignors to Ecological Systems, Inc., Chicago, Ill.

Filed Nov. 4, 1986, Ser. No. 926,953

Int. Cl.[4] B21D *28/28;* B26F *1/14*

U.S. Cl. 83—184 **20 Claims**



1. A piercing die for piercing a hole in a blank having an open interior and an outer wall defining a closed figure from the interior of the blank out through the outer wall to the outside of the blank comprising, in combination,

a base,

a slide movably mounted on the base,

a guide movably connected to the slide to control movement of the slide to a straight line movement,

a hollow female die mounted on said base having an inner working supporting surface defining a receptacle for snugly holding a blank having an inside wall and an outside wall having a surface complementary to the work supporting surface

a male die mounted on the slide,

said female die having a cutting aperture intersecting the blank receptacle,

said female die being split through said cutting aperture

said male die being positioned within the blank receptacle of the female die and mateable with the cutting aperture of the female die to cut a hole in the blank positioned in the blank receptacle of the female die from the interior of the blank through the outer wall to the outside of the blank, and

a cam connectable to the slide for moving the male die toward the female die to engage the blank and to cut the hole in the blank.

4,802,394

NOTCHING DEVICE FOR STRIP WRAPPING MATERIAL

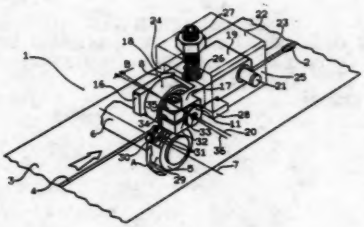
Antonio Gamberini, and Silvano Boriani, both of Bologna, Italy, assignors to G.D. Società per Azioni, Bologna, Italy

Filed Feb. 10, 1988, Ser. No. 154,374

Claims priority, application Italy, Feb. 23, 1987, 3358 A/87

Int. Cl.[4] B26D *1/62*; B26F *1/42*

U.S. Cl. 83—346 **5 Claims**



1. A notching device for strip wrapping material, in particular, for effecting transverse cuts along the length of a continuous strip of transparent outer wrapping material incorporating a longitudinal tear-open ribbon that is severed with each such cut, comprising:

an incision roller, rotatable about a first axis and fitted with at least one peripheral blade of substantially 'U' shape;

a moving support;

a shaft, carried by the moving support and having at least one distinct end section cooperating with the support for adjustment relative to the support of the angular position of the shaft about a second axis lying substantially parallel to the first axis, and at least one further section aligned along a third axis that is angled in relation to the second axis;

a pressure roller mounted rotatably to the section of the shaft that is aligned along the third axis;

calibrated preload means, impinging on the support in such a way that contact between the incision and pressure rollers is invested with a given force.

4,802,395

KNIFE ASSEMBLY FOR NET DISPENSING APPARATUS

John H. Merritt, III, New Holland, and Paul S. Shenberger, Wyomissing, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

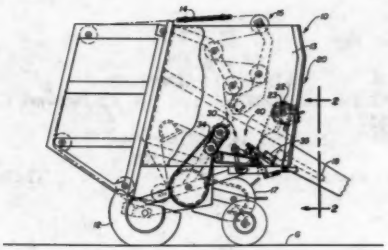
Filed May 1, 1987, Ser. No. 45,944

Int. Cl.[4] B26D *7/00*; A01D *39/00*

U.S. Cl. 83—649 **5 Claims**

1. In a net dispensing apparatus for use on a round baler to dispense netting material into the bale forming mechanism of the round baler where the cylindrical bale formed therein can be wrapped with a layer of said netting material, said net dispensing apparatus having means for retaining a source of supply of said netting material; a feeding mechanism to feed said netting material from said source of supply to said bale forming means; a knife assembly to sever said netting material after a sufficient amount of said netting material has been fed into said bale forming means; and drive means for operably powering said feeding mechanism, an improved knife assembly comprising:

said knife assembly having a pivot means and a cutting edge rotatably movable about a pivot axis between a retracted position and a cutting position, said netting material engaging the pivot means for said knive assembly while being fed from said feeding mechanism to said bale forming mechanism and while said cutting edge is in a retracted position, said netting material remaining in engagement with said knife assembly while said knife assembly is moved from said retracted position to said cutting position, said cutting edge being selectively movable into said netting material without substantially imparting energy into said netting material such that said netting material forms an angle around said cutting edge, whereby a tensile force exerted on said netting material substantially perpendicular to said cutting edge is solely operable to effect a severing of said netting material along said cutting edge.



4,802,396

SABER SAW BLADE

Anthony K. Kuklinski, 426 Penn Rd., Norristown, Pa. 19401

Continuation of Ser. No. 385,346, Jun. 7, 1982, abandoned. This application May 19, 1988, Ser. No. 196,811

Int. Cl.[4] B27B *33/02*

U.S. Cl. 83—849 **1 Claim**

1. For cutting a kerf in wood composed of fibers, a saber saw metal blade in the form of a longitudinally extending web having teeth extending generally in the plane of the web along one side thereof, with means on the web to secure the blade at one end to a reciprocating motor-driven saw so that the blade reciprocates longitudinally of the saw; the improvement comprising

a tooth combination of

(1) shear teeth for shearing fibers at the side of the kerf, and

(2) cleaving teeth for partially cleaving fibers cut on one side of the kerf,

wherein

(1) a single cleaving tooth alternates with a single shear tooth;

(2) the shear teeth have a set out of the plane of the web, with alternating shear teeth having opposite sets; and

(3) the cleaving teeth lie in the plane of the web:

whereby, when the saw blade reciprocates, a sawing action occurs wherein

(1) a first shear tooth set to one side of the web first shears wood fibers at the side of the kerf of the set;

(2) a cleaving tooth adjacent the first shear tooth partially cleaves the said first sheared fivers from the wood, the said cut fibers remaining intact at the side of the kerf opposite the cut made by the first shear tooth, and

(3) a second shear tooth set opposite the first shear tooth shears the said partially cleaved fibers at the side of the kerf opposite the first shear;

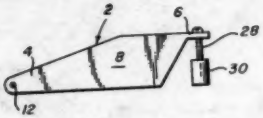
wherein the teeth are symmetrical, whereby the shearing and cleaving action set forth occurs in each direction of reciprocation.

4,802,397

VIBRATO PALM REST

David J. Petschulat, 200 W. Union, Apt. #2, Fullerton, Calif. 92632

Filed Jan. 14, 1987, Ser. No. 3,033
Int. Cl.[4] G10D *3/18*
U.S. Cl. 84—328 12 Claims



1. A palm rest for the vibrato device of a stringed musical instrument such as a guitar, comprising

a rigid support member arranged adjacent the vibrato device and including

(1) means for movably connecting said support member adjacent the vibrato device, whereby said support member moves with the vibrato device when the device is activated from a normal floating rest position to change the tension of the instrument strings; and

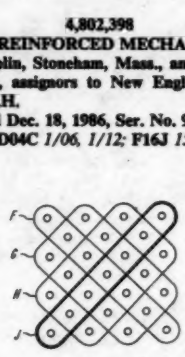
(2) support means for supporting said member in spaced relation adjacent the vibrato device when the device is in its normal floating rest position, whereby said support member prevents the instrument player's hand from inadvertently contacting and moving the vibrato device from its normal floating rest position during play of the instrument.

4,802,398

DIAGONALLY REINFORCED MECHANICAL PACKING

George B. Champlin, Stoneham, Mass., and Charles F. Swan, Brooklyn, Me., assignors to New England Braiding, Inc., Manchester, N.H.

Filed Dec. 18, 1986, Ser. No. 943,950
Int. Cl.[4] D04C *1/06, 1/12;* F16J *15/22, 15/26*
U.S. Cl. 87—8 10 Claims



1. A method for preventing packing extrusion by increasing the strength of a corner of a mechanical compression packing braided on a braider having X-tracks, including the steps of:

providing a high strength yarn braided from the carriers following only one given diagonal X track to provide only one reinforced corner adapted to lie adjacent a shaft to be sealed; and

providing a different and lower strength yarn braided from the carriers following all other tracks of the braider, whereby only a minimum of higher strength yarn is utilized in the braiding of the mechanical compression packing to eliminate packing extrusion.

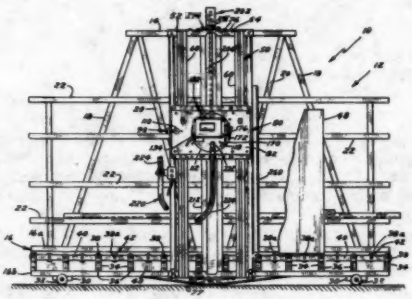
6. A braided mechanical compression packing system including a number of rings of braided mechanical compression packing material having at least two braided yarns and adapted to be placed in a stuffing box having a throat and a gland to compress the rings about a shaft, at least one of the rings including a first braided yarn along only one given diagonal X track to provide a reinforced corner of the packing, with said first braided yarn being a yarn having a higher strength as compared to the other braided yarns in the packing, such that when said at least one ring is properly positioned in said stuffing box about said shaft, extrusion of braided yarn from said last mentioned ring is eliminated with a minimum of said higher strength yarn.

4,802,399

PANEL SAW APPARATUS

Eugene T. Olson, 1250 135th Ave. N.E., Anoka, Minn. 55303

Filed Jul. 27, 1987, Ser. No. 78,412
Int. Cl.[4] B27B *5/06*
U.S. Cl. 83—425 17 Claims



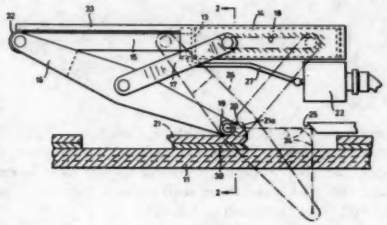
1. Panel saw apparatus comprising a generally upright frame, vertical track means including a pair of laterally spaced H-beams, each having a first pair of oppositely directed leg portions secured to said frame and a pair of second oppositely directed leg portions spaced forwardly of said frame, said vertical track means also including a rail member mounted on each of said second leg portions, a carriage including upper and lower pairs of wheels engaging the rail members on each of said beams so that said carriage is constrained for reciprocable movement in a generally vertical plane forwardly of said beams, said carriage including a plate having a circular opening therein, a turntable mounted for rotation relative to said circular opening and forming a segmental opening relative to an arcuate edge of said circular opening, an electric motor supported on one side of said turntable and said motor having a shaft projecting therefrom, a drive pulley on said motor shaft in alignment with said segmental opening, a saw mount supported on the other side of said turntable and said saw mounted having a shaft projecting therefrom, a driven pulley on one end of said saw mount shaft in alignment with said segmental opening and also in alignment with said drive pulley, the other end of said saw mount shaft being adapted for the attachment of a circular saw blade thereto, and a flexible belt entrained about said pulleys and extending through said segmental opening.

4,802,400

AIR-CARRIED MISSLE LAUNCHER

Dennis Griffin, Guildford, and Ronald F. Delves, Fordingbridge, both of England, assignors to Frazer-Nash Limited, England

Filed Apr. 9, 1987, Ser. No. 36,320
Claims priority, application United Kingdom, Apr. 9, 1986, 8608668
Int. Cl.[4] F41F *3/06*
U.S. Cl. 89—1.57 14 Claims



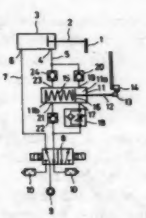
1. An airborne missile launcher, comprising:
a main missile launcher,
a sub-rail for detachable attachment of a missile,
detachable connection means for detachably connecting said sub-rail to said launcher,
jettison means for disconnecting and jettisoning said sub-rail from said launcher,
actuating means for actuating said jettison means where actuating said jettison means causes detachment of said connection means and disconnects and jettisons said sub-rail from said launcher.

4,802,401

PNEUMATICALLY MOVABLE DEVICE WITH A SAFETY LOCK MEANS

Kouichi Osaki, Gunma, Japan, assignor to Ichikoh Engineering, Ltd., Maebashi, Japan

Filed Aug. 3, 1987, Ser. No. 81,210
Claims priority, application Japan, Jan. 20, 1987, 62-009047
Int. Cl.[4] F15B *15/26*
U.S. Cl. 91—44 4 Claims



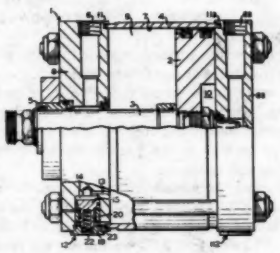
1. A pneumatically movable device with a safety lock means comprising:
a movable member,
a pneumatic actuator connected to said movable member and adapted to move said movable member and having first and second air ports,
a direction control valve connected to said first and second air ports of said actuator,
a locking cylinder connected between said first air port and said direction control valve and having a piston disposed in said cylinder and a spring disposed in said cylinder, the spring pressing against one side of the piston, a first chamber being defined in the cylinder at the side of the piston where the spring is located and a second chamber being defined in the cylinder at the other side of the piston,
a first two openings provided in the first chamber and being respectively connected to said first air port of the actuator and to said direction control valve through respective check valves, the check valves being so arranged as to prevent air from flowing into said cylinder,
a second two openings provided in the second chamber, a first of said second two openings being connected to said first air port of the actuator through a check valve being so arranged as to prevent air from flowing into the locking cylinder and a second of said second two openings being connected to said directional control valve through an other check valve, said other check valve having a restrictor to prevent air from flowing into said direction control valve, and
a locking member attached to the piston rod of said cylinder and an engaging member attached to said movable member and being adapted to engage with and lock said locking member.

4,802,402

CYLINDER HAVING AN INTERNALLY-DISPOSED DRAIN VALVE

Larry K. Rogers, Henderson, Ky., assignor to American Standard Inc., Lexington, Ky.

Filed Nov. 14, 1986, Ser. No. 930,479
Int. Cl.[4] F01B *3/00*
U.S. Cl. 91—268 20 Claims



1. A work cylinder having an internally-disposed drain valve for purging moisture therefrom comprising:
(a) a housing having a bore formed coaxially therein;
(b) a piston, movable within said bore, divides said bore into a first and a second chamber;
(c) a pilot chamber formed in said housing adjacent one of said first and second chambers, and in fluid communication with said one of said first and second chambers through a first passageway;
(d) a plunger member movable within said pilot chamber to a first position when fluid pressure introduced to said one of said first and second chambers is communicated over said first passageway to one side of said plunger, said plunger further being movable to a second position when such fluid pressure introduced to said one of said first and second chambers is exhausted; and
(e) said drain valve being disposed in said pilot chamber and being formed partially on said plunger member, said drain valve being operable to an open condition when said plunger member is in such second position such that moisture from said one of said first and second chambers can be drained to atmosphere, and said drain valve being further operable to a closed condition when said plunger member is in such first position whereby said drain valve is in a closed condition when said one of said first and second chambers is pressurized regardless of the pressure in the other of said first and second chambers.

4,802,403

RETURN MECHANISM OF AN ACTUATING DRIVE

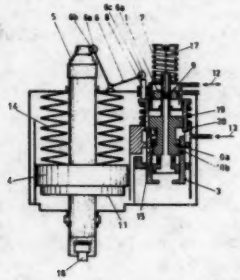
Heinrich Lageder, Siggenthal-Station; Jaroslav Masek, Wettingen, and Kamil Prochazka, Windisch, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Sep. 23, 1986, Ser. No. 910,680

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535174

Int. Cl.[4] F15B 9/10

U.S. Cl. 91—374 1 Claim



1. A return apparatus of an actuating drive for valves wherein the actuating drive includes a control block having a slide valve and a return sleeve, and a servo-piston, the return apparatus comprising:

a shaped connecting surface provided on the servo-piston;

linearly translatable transmission means for acting on the return sleeve to displace the sleeve in response to a displacement of the servo-piston, said linearly translatable transmission means including a pin supported for linear movement in a direction parallel to and offset from the axis of the return sleeve;

a lever pivotally mounted for rotation about a pivot axis extending in a direction generally perpendicular to the central axis of the servo-piston, said lever including a first lever arm having first follower means for contacting said shaped connecting surface and a second lever arm having second follower means for contacting said linearly translatable transmission means, said first and second follower means including rotatable disks mounted to said first and second arms of said lever, said first disk being in rolling contact with said shaped connecting surface of the servo-piston and said second disk being in rolling contact with said return sleeve; and

a control spring positioned colinear with the axis of the return sleeve at a first end of the return sleeve, said transmission means also acting on said first end of the return sleeve.

4,802,404

COMPOSITE CYLINDER ASSEMBLY WITH REMOVABLE LINER ASSEMBLY

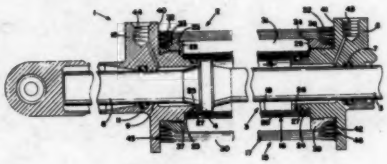
William Dirkin, Portage; Fred Peters, Richland, and Terry L. Benton, Kalamazoo, all of Mich., assignors to Pneumo Abex Corporation, Boston, Mass.

Filed Apr. 6, 1987, Ser. No. 34,858

Int. Cl.[4] F16S 10/02

U.S. Cl. 92—171 37 Claims

1. A composite cylinder assembly comprising axially spaced apart end glands having axially inwardly extending cylindrical end portions with external grooves containing seal means, a removable liner assembly comprising a liner member having circumferential hoop stress windings wrapped about said liner member, said liner member having opposite ends axially slidable onto said cylindrical end portions of said end glands and into direct sealing engagement with said seal means, and an outer wall portion surrounding said removable liner assembly, end rings affixed to opposite ends of said outer wall portion, said end rings having releasable connection means with the respective end glands, said outer wall portion being separate



from said removable liner assembly, the inner diameter of said end rings being greater than the outer diameter of said removable liner assembly to permit removal of said liner assembly from said end glands and outer wall portion upon disconnecting said end rings from said end glands.

4,802,405

AUTOMOTIVE AIR-CONDITIONER

Yutaka Ichitani, Kariya; Masayoshi Imaeda, Nagoya; Yoshimasa Ikeda, Toyota; Yoji Nishimura, Okazaki, and Kiyokazu Seikou, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

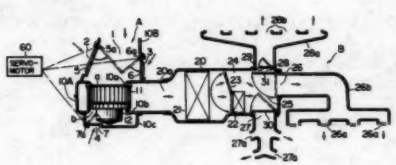
Continuation of Ser. No. 935,682, Nov. 26, 1986, abandoned.

This application Jan. 15, 1988, Ser. No. 145,690

Claims priority, application Japan, Nov. 28, 1985, 60-183274[U]

Int. Cl.[4] B60H 1/26

U.S. Cl. 98—2.06 8 Claims



1. An automotive air-conditioner having a fan section and an air-conditioning section connected to a discharge side of said fan section to receive air therefrom and condition the thus received air, said air-conditioning section having at least one outlet through which the thus conditioned air flows into an occupant compartment, said fan section comprising:

a centrifugal fan having a plurality of circumferentially arranged vanes and axially opposite open ends through which flow of air enter the fan;

a fan casing accomodating said centrifugal fan;

said fan casing having a first wall portion including a first suction port closely adjacent to one of the open ends of said fan, a second wall portion including a second suction port closely adjacent to the other open end of said fan, a first air induction portion connected to said first wall portion and defining a fresh-air inlet and a first recirculated-air inlet both adapted to be communicated with said one open end of said fan, and a second air induction portion connected to said second wall portion and defining a second recirculated-air inlet adapted to be communicated with the other open end of said fans;

a first valve means for selectively opening and closing said fresh-air inlet and said first recirculated-air inlet;

a second valve means for opening and closing said second recirculated-air inlet; and

actuating means operatively associated with said first and

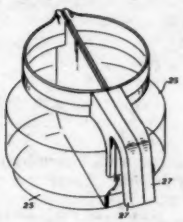
second valve means to actuate them so that said fresh-air inlet and said first and second recirculated-air inlets are operated and closed by said valve means, said actuating means comprising a servomotor and a mechanical link mechanism drivingly connected said servomotor to said first and second valve means, said first and second valve means and said link mechanism being arranged such that, when said fresh-air inlet is opened by said first valve means, said first recirculated-air inlet is closed by said first valve means and said second recirculated-air inlet is closed by said second valve means and such that, when said fresh-air inlet is closed by said first valve means, said first recirculated-air inlet is opened by said first valve means and said second recirculated-air inlet is opened by said second valve means.

4,802,406

COFFEEMAKER

David W. Bouldin, 49 Briar Hollow, Apt. #2003, Houston, Tex. 77027

Filed Apr. 29, 1988, Ser. No. 187,956
Int. Cl.[4] A47J 31/00, 31/06
U.S. Cl. 99—295 4 Claims



1. In an improved coffee brewing apparatus having a supply of heated water and means for dispensing a predetermined quality of said heated water at a predetermined time, the improvement comprising:

a grounds basket having divider means for separating said basket into at least two side by side grounds compartments, said basket having means for attaching to said coffee brewing apparatus so as to receive hot water dispensed by said coffee brewing apparatus, and each of said compartments having a brewed coffee outlet in the bottom thereof for passage of brewed coffee downwardly therethrough;

means associated with said basket for diverting hot water from said coffee making apparatus uniformly to both sides of said basket;

filter means arranged to be received in said grounds compartment for receiving coffee grounds thereinto;

and a pair of containers removably supported beneath said grounds basket for receiving and collecting brewed coffee exiting from said brewed coffee outlets;

whereby coffee grounds of different quality may be placed in each of said grounds compartments and two coffees of different quality may be brewed simultaneously.

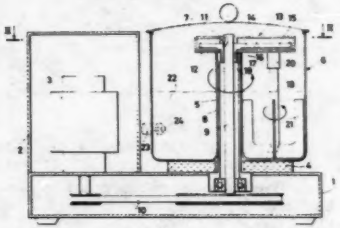
4,802,407

AUTOMATIC ELECTRIC HOUSEHOLD APPLIANCE FOR MAKING CHEESE AND BY-PRODUCTS THEREOF

Cesare Negri, Piacenza; Giorgio Bonini, Carpaneto, and Giorgio Libe', Pontenure, all of Italy, assignors to Philips S.p.A., Italy

Filed May 29, 1987, Ser. No. 55,782
Claims priority, application Italy, Jun. 5, 1986, 44807 A/86; Mar. 20, 1987, 44801 A/87
Int. Cl.[4] A23C 3/02, 9/00
U.S. Cl. 99—453 11 Claims

1. An automatic electric household appliance for making cheese and by-products thereof, comprising a housing seat, a milk container which is removable from said seat, electric heating resistance means associated with said seat near said container, an agitator removably inserted in said container, an electric drive motor for said agitator and an electric control circuit including power supply means for said heating rsistance and said drive motor, two-temperature thermostat means responsive to a lower preselected temperature corresponding to the curdling temperature of milk in the container to stop electrical power supply to the heating resistance, first timing means activated by said thermostat means at said lower temperature to stop electrical power supply to the drive motor at the end of



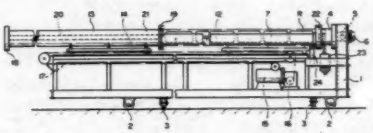
a shorter preselected time adequate for introduction of a coagulant in the milk, second timing means activated by said thermostat means at said lower temperature to restart electrical power supply to the heating resistance and the drive motor and to make the thermostat means responsive to a higher preselected temperature adequate for breaking the curd and converting the same into cheese and surrounding liquid at the end of a longer preselected time, said thermostat means being responsive to said higher temperature to stop electrical power supply to the heating resistances and the drive motor, means for allowing removal of the container from its seat and physical separation of the cheese from the liquid by draining.

4,802,408

COMPACTING APPARATUS OF ROLLED PLASTIC FILMS

Akio Hirabayashi, Saitama; Katsuaki Kaneko, Hasuda, and Yoshitake Okazaki, Ageo, all of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 180,900
Int. Cl.[4] B30B 9/00
U.S. Cl. 100—90 1 Claim



1. An apparatus for pneumatically compacting a roll of plastic films which comprises:

(a) a base stand having an elongated plan;

(b) a hollow cylindrical base shaft fixedly mounted in a horizontal disposition on or above the base stand along the longitudinal direction of the base stand and connected at one end to a means for air supply and evacuation, the other end being open;

(c) a trough for receiving rolls of plastic films pivotally connected to the base shaft at one end in a tiltable manner in the circumferential direction, the other end thereof extending toward the longitudinal direction of the base stand;

(d) an elongated cylindrical drum closed at one end remote

from the base shaft and mounted above the base stand in a movable manner along the longitudinal direction of the base stand to envelope the trough when moved toward the base shaft; and

(e) a means for fastening the open end of the elongated cylindrical drum to the open end of the base shaft and air-tightly connecting the same together.

4,802,409

PRINTING MECHANISM WITH TORQUE LIMITING DETENT ELEMENTS ON ACTUATING KNOB

Heinrich Volk, Beerfelden-Gammelsbach, and Ulf Koch, Eberbach, both of Fed. Rep. of Germany, assignors to Esselte Meto International GmbH, Fed. Rep. of Germany

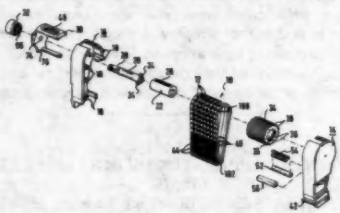
Filed Nov. 24, 1986, Ser. No. 934,036

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1986, 3635733

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[4] B41J *1/20*

U.S. Cl. 101—111 13 Claims



1. A printing mechanism comprising:

a plurality of type carriers carrying printing types in one peripheral region and indictor type in another peripheral region, the printing types are brought into a printing position by turning the type carriers;

a setting means including an actuating knob, a setting shaft operably connected to said actuating knob and a driver means for turning the type carriers in response to turning of said setting shaft, said setting means being axially displaceable to be brought into a drive connection with each of the type carriers for rotation therewith;

stop means provided at the type carriers for limiting the turning travel of the type carriers;

said actuating knob is connected to said setting shaft by way of a torque limiting means which permits said actuating knob to rotate relative to said setting shaft when the torque necessary to turn a type carrier is greater than a predetermined slip torque, but provides a direct connection below said predetermined slip torque, said torque limiting means comprising resilient detent elements operatively connected to one of said actuating knob and said setting shaft for engaging a shaped means on the other of said actuating knob and said setting shaft, said predetermined slip torque is governed by the spring hardness of said resilient detent elements and is greater than the force necessary to turn the type carriers and less than the force resulting from the effect of said stop means.

4,802,410

SHEET GRIPPER ARRANGEMENT FOR SILK SCREEN PRINTER

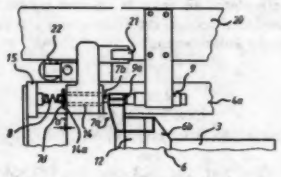
Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silkscreen Maskiner AB, Norsborg, Sweden

Filed Jun. 4, 1987, Ser. No. 58,272

Claims priority, application Sweden, Jun. 5, 1986, 86 02551; Apr. 1, 1987, 87 01365

Int. Cl.[4] B41F *15/08, 15/14*

U.S. Cl. 101—124 20 Claims



1. A silk screen printer comprising:

a substantially cylindrical printing table adapted to apply print to a sheet of material;

a stencil stretched in a movably mounted frame and arranged above the printing table;

a squeegee arrangement for urging the stencil against the printing table and to thereby transfer print onto said sheet of material located between the printing table and the stencil;

gripping means for gripping a forwardly located end part of said material, as seen in the direction of movement, during at least a part of the printing operation, said gripping means being mounted for movement with the frame in a direction along the longitudinal extent of the frame;

a spring device for urging said gripping means against a first stop means, said spring device being mounted for movement with said frame.

4,802,411

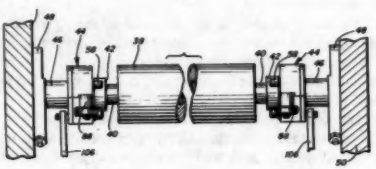
ADJUSTABLE MOUNTING BRACKET FOR PRINTING OR DUPLICATING MACHINE

Stanley Witczak, Chicago, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Feb. 6, 1987, Ser. No. 11,568

Int. Cl.[4] B41F *5/00*

U.S. Cl. 101—216 18 Claims



1. A bracket assembly for receiving and positionally adjusting the shaft end of a distribution roller in a printing, duplicating or like machine, comprising:

a pin head structure mounted on a framework of the machine;

a triangular array of pins projecting inwardly of the pin head axially of the roller for receiving the shaft end of the roller in a position of engagement between the sides of the pins and the sides of the shaft end;

means for adjusting at least one of said pins generally in a radial direction to take up any radial play between the roller shaft end and the pin array;

means for adjusting at least one of said pins in an axial direction to take up any axial play between the roller shaft end and the pin head structure; and

means for retracting at least one of said pins to allow for insertion of the roller into position between the pins.

4,802,412

IMPRINTER APPARATUS WITH CHANGEABLE CASSETTE IMPRINT ROLLER STRUCTURE

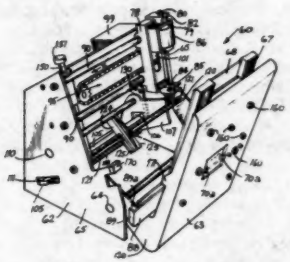
David G. Edwards, Dublin; Gerard Finlay, Naven; David J. Boyle, Leixlip, all of Ireland; Clyde C. Heasly, Jr., Arlington, Va.; Joseph M. Walsh, Raheny, Ireland, and Ralph J. Poling, Walkersville, Md., assignors to Security Imprinter Corporation, Walkersville, Md.

Continuation-in-part of Ser. No. 834,633, Feb. 28, 1986, abandoned. This application May 6, 1987, Ser. No. 46,557

Claims priority, application Ireland, Jun. 4, 1985, 1376/85; Nov. 21, 1985, 2918/85

Int. Cl.[4] B41F *3/04*

U.S. Cl. 101—269 **20 Claims**



1. Imprinter apparatus for imprinting characters from a character imprint source member onto imprint recording sheet material such as document sheets or the like, comprising an imprinter means housing section including a casing having movable roller means for transversely rectilinearly traversing a path laterally spanning an imprint station and drive means for moving said roller means back and forth along said path, the roller means including a horizontally slidable carrier block member and a changeable cassette carried thereby having a changeable vertically slidable roller block member and a vertically elongated generally cylindrical imprinter roller rotatably carried by said roller block member, the drive means comprising a pair of spaced-apart rotatable sprockets and an endless drive chain trained about said sprockets, the drive chain having a spud projecting therefrom, a pair of vertically spaced guide track members engaging and slidably supporting said carrier block member to guide the carrier block member and roller block member carried threby along said path, the carrier block member having a slot receiving said spud therein for driving the carrier block member and roller block member and roller carried thereby back and forth through advance and return strokes spanning said imprint station as the spud moves with said drive chain between said sprockets, said carrier block member having roller block support means movable from an operative position for imprinting document sheets to a release portion for removal and replacement of the roller block member and roller carried thereby, and a carrier member hinged for movement about a pivot axis to said housing section adjacent the path traversed by the roller means at said imprint station, said carrier member having a recess for receiving the imprint source member therein and a pocket formation for the recording sheet material, the carrier being movable about said pivot axis between an open position exposing said recess and pocket formation for introduction and withdrawal of the source member and sheet material and a closed position locating the sheet material and source member at said imprint station, said roller upon movement of said carrier block member and roller block member and its roller through said advance stroke by said spud and drive chain pressing the sheet material by said roller against said source member to produce a character imprint thereon.

4,802,413

PRINTING PLATE SECURING

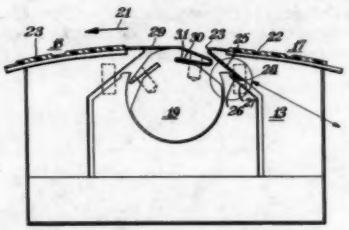
Richard B. Schroeder, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jun. 24, 1987, Ser. No. 65,951

Claims priority, application United Kingdom, Jul. 11, 1986, 8616952

Int. Cl.[4] B41F *1/30, 13/08*

U.S. Cl. 101—415.1 **20 Claims**



1. In a printing plate assembly of a rotary printing press wherein a printing plate is mounted to a plate cylinder and wherein the printing plate includes at least one pair of semi-cylindrical substrates mounted around the periphery of the plate cylinder, the improvement being in said substrates being made of resilient, flexible non-metallic material, locking means for securing said substrates to said plate cylinder, said locking means including the leading end in the non-printing area of at least one of said substrates being formed in a multiple bend, said multiple bend forming a first bent portion being in the reverse direction to said one substrate and below the printing surface of said one substrate, said multiple bend further forming a second bent portion being at an angle to said first bent portion and below said printing surface of said one substrate, said assembly including a narrow elongated recess which is non-radial with respect to the axis of said plate cylinder, said recess being below said printing surface and being exposed at said leading end, a shoulder at the mouth of said recess defining a narrow passageway with said recess being wider beyond said shoulder, said multiple bend in its uncompressed condition being wider than the width of said recess, said multiple bend being inserted into said recess in a compressed condition and engaged against the walls of said recess, and the free end of said multiple bend being against the same wall as said shoulder at a steep angle thereto and disposed beyond and in contact with said shoulder whereby said multiple bend springs open beyond said shoulder and said shoulder prevents said multiple bend from being inadvertently removed from said recess.

4,802,414

MULTIPLE-CONTACT PLUG CONNECTION FOR ELECTRICALLY ACTUATABLE TRIGGERING MEDIA

Kurt Fiedler, Diepersdorf, and Bernhard Kratz, Wendelstein, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Nov. 3, 1987, Ser. No. 116,023

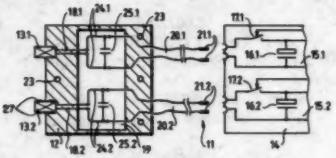
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3638084

Int. Cl.[4] F42C *11/00*

U.S. Cl. 102—206 **7 Claims**

1. A multiple-contact plug connection for multiple electrically actuatable triggering devices, comprising an identifying

capacitor connected in parallel with each said triggering device, with each identifying capacitor having a different value of capacitance from each other identifying capacitor, such that each particular triggering device can be positively identified



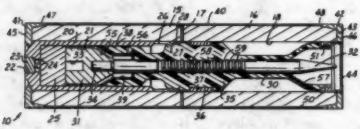
by measuring the capacitance of the identifying capacitor associated therewith, whereby the values of the capacitances of the identifying capacitors for different triggering devices clearly distinguish from each other.

4,802,415

TELESCOPED AMMUNITION ROUND HAVING SUBCALIBER PROJECTILE SABOT WITH INTEGRAL PISTON

Stephen E. Clarke, Orange; James D. Hendry, Huntington Beach, and Ernest R. Mijares, Sunset Beach, all of Calif., assignors to Ford Aerospace Corporation, Newport Beach, Calif.

Filed Dec. 28, 1987, Ser. No. 138,259
Int. Cl.[4] F42B *5/02*
U.S. Cl. 102—434 **12 Claims**



1. A telescoped ammunition round comprising:
a propellant charge having an axial cavity for supplying firing power for said ammunition round;
a control tube means housed within said axial cavity for selectively covering an aft surface portion of said axial cavity, said control tube means having a generally cylindrical axial bore substantially coaxial with said axial cavity;
a discarding sabot concentric with and extending axially within said axial cavity, having an aft end within said axial bore, said sabot comprising at its aft end a piston integral therewith, said piston having a generally cylindrical outer surface forming a sliding fit with said axial bore;
a subcaliber projectile mounted within said discarding sabot;
a booster charge mounted within said axial bore aft of said piston, said discarding sabot being forwardly moveable in response to pressure against a rearward facing surface of said piston generated during firing of said booster charge and said projectile being forwardly moveable by forward movement of said discarding sabot; and
a primer means in communication with said booster charge for actuating a firing of said ammunition round.

4,802,416

CABLEWAY HAVING A MULTIPASS LIFT CABLE

Bernd Meindl, Hard, Austria, assignor to Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft mbH & CO. KG, Wolfurt, Austria

Filed May 29, 1987, Ser. No. 56,600
Claims priority, application Austria, Jun. 3, 1986, 1489/86
Int. Cl.[4] B61B *7/00, 11/00*
U.S. Cl. 104—192 **9 Claims**

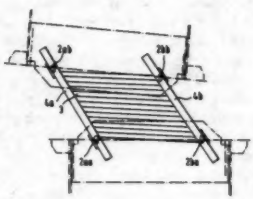
1. In a cableway having a multipass lift cable, especially a double pass lift cable, with a plurality of couplable and uncouplable conveying means, in which said lift cable is driven at one of at least two cable stations by drive-sheave means having at least two drive sheave grooves coupled with one another for joint rotation, the improvement wherein said lift cable is formed by a single endless cable loop which is crossed at least once to form a plurality of cable segments, said cable segments near the regions where said conveying means are couplable and uncouplable and in the conveying path between said regions are guided parallel and adjacent each other and at least one crossing point of said single closed cable loop is positioned between one of said regions and one of said cable stations containing a guide sheave means with at least two guide-sheave rollers having respective grooves or said drive-sheave means, said lift cable being fed to or guided from at least two of said guide-sheave grooves or said drive-sheave grooves positioned one over the other at different heights by a plurality of deflection rolls, said lift cable being guided at least approximately horizontally in said regions where said conveying means are couplable and uncouplable each of said conveying means being simultaneously suspended from at least two of said segments guided parallel and adjacent to each other.

4,802,417

GANGWAY FOR A RAILWAY CAR PASSAGEWAY

Wolfgang Klüker, Salzgitter; Peter Braemert, Wolfenbüttel, and Werner Ortmann, Minden, all of Fed. Rep. of Germany, assignors to Linke-Hofmann-Busch GmbH, Fed. Rep. of Germany

Filed Jul. 14, 1987, Ser. No. 73,016
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628627
Int. Cl.[4] B61D *17/00, 17/14*; B60D *5/00*
U.S. Cl. 105—8.1 **20 Claims**



1. A gangway for spanning a space between adjacent ends of two railway cars, comprising: a plurality of substantially rigid-parallel and spaced apart rails forming a bridge area in the space; bridge bearings connected to the end of each railway car, each said bridge bearing being pivotable with respect to the end of a railway car for pivotal movement about an axis;

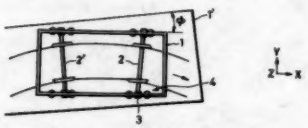
guide means for supporting said rails for sliding with respect to each other, said guide means being mounted on said bridge bearings for pivoting therewith and for lengthwise movement with respect to said bridge bearings.

4,802,418

WHEELSET STEERING APPARATUS AND METHOD FOR THE TRUCK OF RAILWAY VEHICLES

Isao Okamoto, Musashino; Katsuyuki Terada, Kudamatsu; Hiromi Go, Kudamatsu; Michio Sebata, Kudamatsu; Hiroshi Higaki, Kudamatsu, and Hideo Takai, Hikari, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1987, Ser. No. 8,340
Claims priority, application Japan, Jan. 29, 1986, 61-15670
Int. Cl.[4] B61F *5/30*
U.S. Cl. 105—167 **4 Claims**



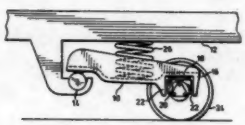
1. A wheelset steering apparatus for a truck of a railway vehicle, comprising a wheelset, a truck frame, an axle box to be rotatably installed on said wheelset, and an axle box retaining means, which includes a first elastic means for retaining elastically said axle box in the longitudinal direction as well as in the lateral direction of the truck with regard to said truck frame while carrying vertical loadings on said truck frame with regard to said axle box, and a second elastic means having a variable spring constant in the longitudinal direction of the truck in the running condition of the vehicle such that a bending stiffness of said wheelset is smaller on a curved track than on a straight track and a shearing stiffness is larger on a curved track than on a straight track.

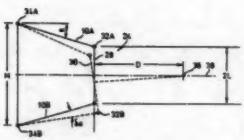
4,802,419

STEERED AXLE FOR A RAILWAY VEHICLE

Roy E. Smith, Kingston, Canada, assignor to Urban Transportation Development Corporation, Toronto, Canada

Filed Oct. 8, 1986, Ser. No. 917,115
Int. Cl.[4] B61F *5/38*
U.S. Cl. 105—171 **3 Claims**





3. In combination with a rail vehicle, a first and second wheel set and swinging arm assembly, each wheel set and swinging arm assembly comprising:

a wheel set;

a first swinging arm having two ends, pivotally connected at one end to the rail vehicle to form a first pivot point and pivotally connected at the other end to the wheel set to form a second pivot point;

a second swing arm of equal length to the first swinging arm and having two ends, pivotally connected at one end to the rail vehicle to form a third pivot point and pivotally connected at the other end to the wheel set to form a fourth pivot point;

spring means for supporting the rail vehicle on the wheel set and swinging arm assembly; and

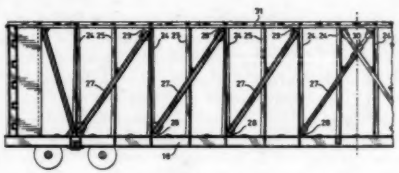
a connecting linkage between the wheel set and swinging arm assemblies including a first rigid connecting arm pivotally connected to the first swinging arm of the first wheel set and swinging arm assembly, a second rigid connecting arm rigidly connected to the longitudinally adjacent swinging arm of the second wheel set and swinging arm assembly, and the first and second rigid connecting arms being pivotally connected to each other so that the two wheel set and swinging arm assemblies rotate conformably with each other.

4,802,420

CENTRE BEAM RAILROAD CAR

Ronald S. Butcher, and Mohamed A. Khattab, both of Burlington, Canada, assignors to National Steel Car Limited, Hamilton, Canada

Filed Jul. 21, 1987, Ser. No. 76,176
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—355 **8 Claims**



1. A freight car of the bulkhead flat car type having a centre beam structure extending between a pair of end bulkheads and supporting substantially the entire load carried by the freight car, the centre beam structure comprising a substantially vertical spine, extending the length of the centre beam structure, and crossbearers forming a load-carrying surface; the vertical spine connecting to a compression member in the form of an open truss extending in a substantially horizontal plane and aligned centrally about the vertical spine and extending the length thereof, the compression member absorbing compressive and lateral stresses transferred to the spine in use, wherein the compression member is mounted to extend along the top end of the vertical spine and comprises a rail member aligned on top of the vertical spine and extending the length of the compression member; a number of spaced apart, cross-members each secured at its mid-portion to the rail member and extending laterally therefrom; two edge rail members extending the length of the compression member, one on each side of the rail member, and joining the ends of the cross-members; and a diagonal cross-member extending between each pair of adjacent cross-members.

4,802,421

PALLET CONSISTING OF TWO OR SEVERAL BASE MEMBERS

Fred Atterby, Revviken, S-181 90 Lidingö ; Bertil Voss-Schrader, Korshamnsviken, S-139 00 Värdmö , and Lennart Tenggvist, Karlavägen 85, S-114 59 Stockholm, all of Sweden

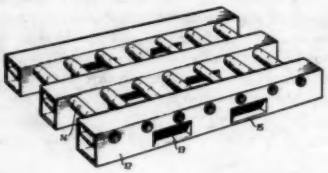
PCT No. PCT/SE86/00556, § 371 Date Aug. 12, 1987, § 102(e) Date Aug. 12, 1987, PCT Pub. No. WO87/03859, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 8, 1986, Ser. No. 93,498

Claims priority, application Sweden, Dec. 19, 1985, 8506025

Int. Cl.[4] B65D *19/20*

U.S. Cl. 108—51.1 17 Claims



1. Pallet consisting of at least two elongate base members having upper and lower, surfaces and side surfaces said base members having a number of holes provided laterally through the side surfaces perpendicularly to their elongate length directions, distributed along and closely adjacent the upper surfaces of the base members, through which holes, tubes can be inserted under friction so as to unite the base members to the formation of the pallet, characterized in that: each base member of the said pallet consists of three pressed carton pieces (1,2,3) folded to a rectangular U-section, each piece having a length corresponding to the length of the base member, of which the first (1) and the second (2) U-section carton pieces have a height corresponding substantially to the height of the pallet, whereas the third U-section carton piece (3) has a height dimension of the inner surface of its upright portions of its folded U-section which approximates the diameter of the tubes; of which folded carton pieces, one of the first (1) and the second (2) U-section carton pieces in the assembled base member is disposed in the upright U-form with the back of the U-section downwards, the other of the two U-section carton pieces (1,2) is disposed in the inverted U-form and situated within the said one carton piece (1 or 2) and wherein the said third U-section carton piece (3) is located in the assembled base member in an upright U-form disposed within and uppermost in said other U-section carton pice (1 or 2), the distance between the vertical walls of the carton pieces folded to the rectangular U-form being such that they fit closely to each other and by gluing are tightly fixed to each other at surfaces in contact with each other, the holes for the tubes being located so as to lead through the space enclosed by the third carton piece (3) uppermost in the base member, whereupon the tubes are supported by the horizontal inner surface of the third U-section carton piece (3) and by the horizontal inner surface of the other of said U-section carton pieces (1 or 2).

4,802,422

WORK SURFACE GANGING CLIP

Michael D. Beard, Hudsonville, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Continuation of Ser. No. 860,095, May 6, 1986. This application Sep. 15, 1987, Ser. No. 96,665

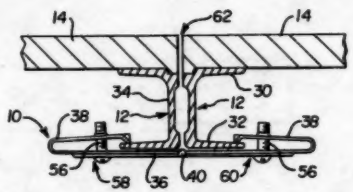
Int. Cl.[4] A47B *57/00*

U.S. Cl. 108—64 14 Claims

1. A clip adapted to mount to first and second support brackets to secure first and second work surfaces mounted thereto in load transmitting relationship, said first and second support brackets being mounted to a wall in side-by-side relationship and having opposed first and second substantially horizontal legs, wherein said clip comprises:

a clamp means comprising a first lower portion, a first upper portion connected to said first lower portion, a first pin extending through said first upper and lower portions and a first drawing means on said first pin, engaging said first upper and lower portions and for drawing said first upper and lower portions toward each other to secure said first horizontal leg between said first upper and lower portions;

a securing means comprising a second lower portion connected to said first lower portion, a second upper portion connected to said second lower portion, a second pin extending through said second lower and upper portions and a second drawing means on said second pin, engaging said second upper and lower portions and for drawing said



second upper and lower portions toward each other to secure said second horizontal leg between said second upper and lower portions to secure said first and second work surfaces together in load transmitting relationship; and

an adjustment means comprising a first pivot means connected to said first lower portion, engaging said first horizontal leg and positioned on said first lower portion so as to provide a fulcrum for bending and pivoting of said first lower portion with respect to said first horizontal leg;

whereby tightening said first drawing means causes said first lower portion to deflect upwardly and to bend and pivot about said first pivot means thereby forcing said second lower portion to deflect downwardly, with respect to said first lower portion, to exert a force tending to lower said second work surface relative to said first work surface.

4,802,423

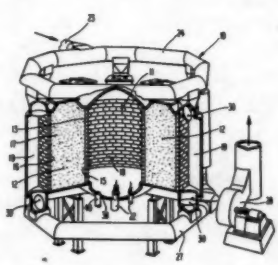
COMBUSTION APPARATUS WITH AUXILIARY BURNING UNIT FOR LIQUID FLUIDS

Rodney L. Pennington, Morris Township, Morris County, N.J., assignor to Regenerative Environmental Equipment Co. Inc., Morris Plains, N.J.

Filed Dec. 1, 1987, Ser. No. 127,158

Int. Cl.[4] F23B *7/00*

U.S. Cl. 110—233 16 Claims



1. A combustion apparatus for incinerating gaseous fluids, comprising a combustion chamber, means for delivering gases

to be burned into the combustion chamber and for withdrawing the gaseous products of combustion therefrom, and means for burning the gases thus delivered while in the chamber, the improvement comprising an auxiliary burning unit for burning combustible waste liquid as a fuel and for delivery of hot gases resultant therefrom into the combustion chamber, said unit including:

(a) a burning chamber;

(b) means for delivering liquid fuel and air to the burning chamber of the unit for ignition of liquid fuel and for providing a desired burning temperature in the burning chamber;

(c) with said burning chamber including means defining first and second elongate paths of travel for products of combustion; and

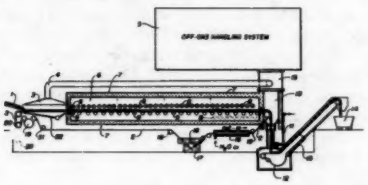
(d) said first and second elongated paths being at least in part on opposite sides of a common shared wall.

4,802,424

FURNACE FOR HAZARDOUS MATERIALS

Francis K. McGinnis, III, Dallas, Tex., and John F. Enright, III, Lancaster, Pa., assignors to Nass, Inc., York, Pa.

Filed May 26, 1988, Ser. No. 199,276
Int. Cl.[4] F23G 5/00, 5/10, 5/12
U.S. Cl. 110—250 12 Claims



1. In a continuous furnace for thoroughly treating hazardous materials to convert such materials to environmentally acceptable materials, the furnace including a continuous belt adapted to carry hazardous materials through at least one heated zone without release of noxious fumes or noxious solids to the environment, the improved combination comprising:

(a) a charging zone located in the open atmosphere adapted to spread the hazardous material charge on the moving belt before introduction into a heated zone, said charging zone being equipped with an exhaust hood ducted to convey to an off-gas handling system any volatile materials emitted while spreading;

(b) at least one substantially air-tight heated high temperature zone adapated to drive off volatiles and detoxify solids on the belt without release to the enviornment;

(c) an enclosed discharged zone having cooled walls and adapted to:

(i) discharge volatiles to an off-gas handling system for conversion of hazardous volatiles to environmentally acceptable materials;

(ii) convey solids to a solids collecting zone;

(d) means to move the continuous belt outside of the heating zone from the discharge zone to the charging zone; and

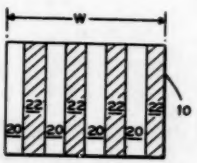
(e) means positioned between the discharge zone and the charging zone to cool the continuous belt prior to its return to the charging zone.

4,802,425

HIGH TEMPERATURE FIBER SYSTEM WITH CONTROLLED SHRINKAGE AND STRESS RESISTANCE

Edwin J. Dickson, Augusta, Ga., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 16, 1982, Ser. No. 450,401
Int. Cl.[4] F23M 5/00
U.S. Cl. 110—336 4 Claims



1. A fibrous lining for an interior of a furnace or the like, said lining having a hot and cold face, said lining comprising:

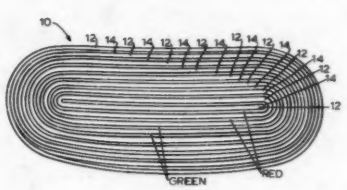
alternate strips of a first fibrous material, a second fibrous material material mechanically stronger than said first material but less shrink resistant then said first material and means for attaching the strips to a furnace wall such that the alternating strips of a first and second fibrous material, laid edgewise, form the hot face of the lining to provide a fibrous lining exhibiting the shrink resistance of a lining composed entirely of said first fibrous material.

4,802,426

METHOD OF MAKING BRAIDED RUG CONSTRUCTION

Walter L. Hinshaw, 3200 Alamance Rd., Burlington, N.C. 27215

Division of Ser. No. 48,885, May 12, 1987, Pat. No. 4,764,407.
This application Apr. 25, 1988, Ser. No. 185,841
Int. Cl.[4] D04C 1/06; D04H 13/00; D05B 93/00
U.S. Cl. 112—262.1 7 Claims



1. The method of making a braid type rug, comprising:

(a) starting with one end of a strand of braid at the center of the rug, coiling the braid to form a rug of selected size and shape;

(b) starting with one end of a first auxiliary strand substantially smaller in size than said braid and secured by stitches to said one end of the braid, coiling said auxiliary strand such that said auxiliary strand in relation to said braid lies outside but immediately adjacent the junction of and between and parallel to adjacent strands of said braid and exposed to view; and

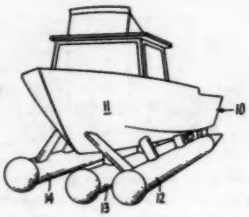
(c) stitching said braid and auxiliary strand together to retain said braid and auxiliary strand in said relation throughout the portion of the rug in which said auxiliary strand is employed.

4,802,427

SHIP HULL CONSTRUCTION

Donald R. Biegel, Napa, Calif., assignor to Tri-Albi Corporation, Napa, Calif.

Continuation of Ser. No. 892,310, Aug. 4, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 155,876
Int. Cl.[4] B63B *1/12*
U.S. Cl. 114—61 12 Claims



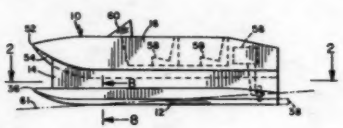
1. A ship hull construction comprising an upper main buoyant hull having a generally V-shaped bottom including a submerged keel and chines, and three submerged substantially cylindrical sub-hulls, one sub-hull being located directly beneath the keel of the main hull, the other two sub-hulls being located above and to opposite sides of said one sub-hull, each sub-hull being mounted to the underside of said main hull and imparting a constant buoyancy force thereto; whereby said V-shaped bottom and sub-hulls cooperatively define five throat areas through which water movement occurs to dampen roll and yaw movements of the ship hull without changing the total buoyancy force of said sub-hulls, said five throat areas being a first throat area defined by said keel and said one sub-hull, said second and third throat areas being defined by said other two sub-hulls and their respective chines, and said fourth and fifth sub-hulls being defined by said one sub-hull and each of said other two sub-hulls.

4,802,428

PLANING CATAMARAN VESSEL

Thomas G. Lang, 417 Loma Larga Dr., Solana Beach, Calif. 92075

Filed Mar. 17, 1987, Ser. No. 26,774
Int. Cl.[4] B63B *1/00*
U.S. Cl. 114—61 36 Claims



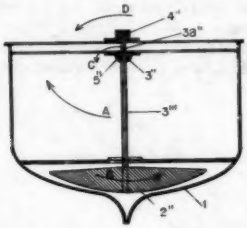
1. A catamaran vessel, comprising:
a pair of spaced, parallel elongated pontoons;
at least one strut extending upwardly from each of the pontoons;
each strut having a streamlined nose region and having a width less than that of the attached pontoon;
a superstructure supported on said struts for riding above the waterline; and
each pontoon having a lower planing surface for planing on the water surface at speed and sharp chines at its inner and outer side edges, the cross-sectional width of the pontoon varying along at least part of its height with the widest point of the cross-section being below the top of the pontoon, the pontoon lying at least substantially below the waterline when the vessel is at rest in the water and planing on the water surface with the majority of the pontoon lying above the water line when the vessel travels at speed in the water.

4,802,429

VESSEL SUCH AS A SHIP, BOAT AND THE LIKE PROVIDED WITH STABILIZING MEANS

Kemal Butka, 372 Central Park West, Apt. 20 J, New York, N.Y. 10025

Filed Sep. 11, 1987, Ser. No. 96,966
Int. Cl.[4] B63B *39/02*
U.S. Cl. 114—124 13 Claims



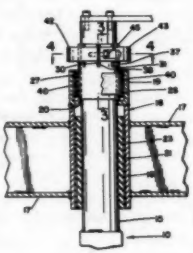
1. A vessel such as a ship, a boat and the like, comprising a hull having an inner hollow; a substantially vertical fixed support element fixedly connected with said hull; and a stabilizing element located in said inner hollow, one of said elements having a passage while the other of said elements at least partly freely extending through said passage and being limitedly turnable relative to said one element, so that in the absence of waves, wind and the like said elements are spaced from and do not abut against one another, while when said hull together with said fixed support element turns about a horizontal axis in a first direction under the action of waves, wind and the like, said elements come to abutment against one another and the abutment produces a moment which urges said fixed support elemeat and therefore said hull to turn in a second direction which is opposite to said first direction so as to stabilize the vessel.

4,802,430

COMPOSITE RUDDER SEAL

James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 26, 1987, Ser. No. 112,649
Int. Cl.[4] B63B *3/40*
U.S. Cl. 114—169 9 Claims



1. A bearing assembly for use with a steering rudder for a ship comprising a cylindrical housing with an upper portion and a lower portion, said cylindrical housing having a central bore therethrough, said lower portion having a sleeve of anti-

friction material bonded to the central bore thereof, a rudder shaft journaled in said central bore, said shaft having a thick annular rubber bearing member bonded thereto which slidingly engages said sleeve of antifriction material, said shaft having a thin rubber sleeve bonded to the upper portion thereto, a fiberglass sleeve bonded to said rubber sleeve, an annular rubber ring bonded to said fiberglass sleeve, the upper portion of said cylindrical housing having a fiberglass ring bonded to said central bore thereof, a ring of antifriction material bonded to said fiberglass ring for frictional sliding engagement with said rubber ring and for putting said rubber ring under compression.

4,802,431

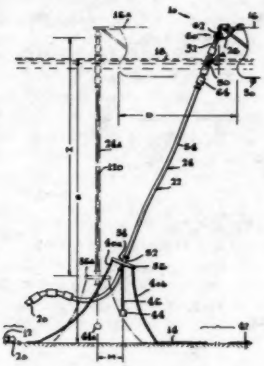
LIGHTWEIGHT TRANSFER REFERENCING AND MOORING SYSTEM

Jack Pollack, Reseda, Calif., assignor to Amtel, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 802,860, Nov. 27, 1985, Pat. No. 4,727,819, which is a continuation-in-part of Ser. No. 603,434, Apr. 24, 1984, Pat. No. 4,637,335, which is a continuation-in-part of Ser. No. 438,322, Nov. 1, 1982, abandoned. This application Apr. 27, 1987, Ser. No. 43,174

Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—230 **6 Claims**



4. An offshore fluid transfer system for transferring fluid between a pipe lying near the sea floor and a dynamically positioned vessel, comprising:

a dynamically positioned vessel which includes a thruster;

a riser extending along most of the height of the sea, and having upper and lower ends, said riser including a fluid conduit for coupling said pipe near the sea floor and said vessel;

means for pivotably coupling said upper riser end to said vessel to allow relative pivoting of the riser upper end to the vessel about two horizontal axes;

means coupling the lower riser end to the sea floor, for allowing the lower riser end to pivot about horizontal axes and move by limited amounts both horizontally and vertically, and for weighting the bottom of said riser to keep it under tension;

means responsive to tilting of said riser upper end from the vertical, and a known relationship between such tilting and drift which takes into account movement of the lower end of the riser, for controlling said thruster.

4,802,432

MOORING DEVICE

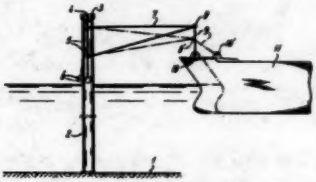
Leendert Poldervaart, La Turbie, and Raymond Hervouet, Cap D'Ail, both of France, assignors to Single Buoy Moorings Inc., Marly, Switzerland

Filed Jun. 18, 1987, Ser. No. 63,462

Claims priority, application Netherlands, Jul. 1, 1986, 8601716

Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—230 **2 Claims**



1. In a mooring device comprising a mooring element anchored to the bottom of a body of water, said mooring element having a weighted structure swingably suspended from it at a location situated above the center of gravity of the weighted structure, said weighted structure being rotatable with respect to the said mooring element about a vertical axis, said device further comprising a rigid arm extending from said weighted structure toward a vessel, the connection of said arm with the vessel comprising a horizontal axis of rotation; the improvement in which the rigid arm forms a rigid entity with the weighted structure, and the end of the said rigid arm remote from the weighted structure and adjacent the vessel is connected with the vessel by means of a tension-resistant connecting element, and in which when said center of gravity of said weighted structure is in its lowest position, said tension-resistant connecting element is upright.

4,802,433

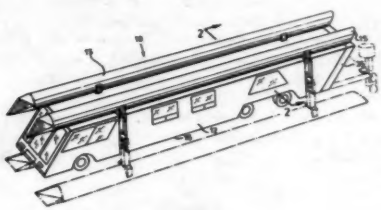
AMPHIBIOUS VEHICLE

Andrew J. Kovac, 4474 Shelby Crescent, Mississauga, Ontario, Canada L4W 3T3

Continuation-in-part of Ser. No. 885,844, Jul. 16, 1986, Pat. No. 4,691,657. This application Aug. 27, 1987, Ser. No. 90,951

Int. Cl.[4] B63B *35/00*

U.S. Cl. 114—270 **4 Claims**



1. An amphibious vehicle having a front, a rear and two sides, comprising:

a frame provided with wheels for transporting the vehicle on land;

a body attached to the frame, the body having a watertight lower portion enabling the vehicle to float in a body of water;

pontoons for the vehicle to provide flotation of the vehicle in a body of water, the vehicle having at least one pontoon positionable laterally along each side thereof;

at least two pivoting arms for moving each pontoon from a stowed position atop the vehicle to an operating position alongside the vehicle, each arm having one end attached to the pontoon and the other end attached to two continuous cables positioned on either side of the arm, each cable being arranged about a plurality of pulleys in a parallel manner to define a curved path for movement of the end of the arm attached to the cable approximately 180° about a pivot so that the pontoon may be moved into the desired position; and means for causing the cable to move along the path defined by the pulleys.

4,802,434

ANCHOR

Peter Bruce, Onchan, United Kingdom, assignor to BruPat Limited, Onchan, United Kingdom

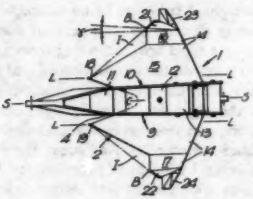
PCT No. PCT/GB86/00522, § 371 Date May 5, 1987, § 102(e) Date May 5, 1987, PCT Pub. No. WO87/01347, PCT Pub. Date Mar. 12, 1987

PCT Filed Mar. 9, 1986, Ser. No. 46,857

Claims priority, application United Kingdom, Sep. 5, 1985, 8522062; May 3, 1986, 8610914

Int. Cl.[4] B63B *21/34*

U.S. Cl. 114—294 **23 Claims**



1. A marine anchor comprising a fluke arranged transversely to a longitudinal plane of symmetry of the anchor, a shank adapted at one end for attachment to an anchor line and at the other end for attachment to said fluke, said fluke including a main fluke member and fluke side structures on each side of said plane of symmetry, each fluke side structure including an upstanding lug and an auxiliary fluke attached to the lug so as to be remote from the plane of symmetry, each auxiliary fluke extending substantially transversely to said plane of symmetry and providing a leading surface inclined upwardly at an acute forwardly opening angle β_1 to a plane at right angles to said plane of symmetry and having a fluke central line; and support means about which the anchor tilts when inverted on a firm horizontal mooring be surface to bring one of said fluke side structures into contact with the mooring bed with the leading surface of the auxiliary fluke of said one fluke side structure inclined upwardly at an obtuse forwardly opening angle β_2 to the horizontal mooring bed surface whereby the auxiliary fluke digs into the mooring bed surface on forward movement of the inverted anchor.

4,802,435

SAFETY BOAT ASSEMBLY

Tai J. Choi, 1375 Hwanghak-Dong, Joong-Ku, Seoul, Rep. of Korea, assignor to Tai Jin Choi; Jung Bai Kim; Young Sung Park and Sai Hwan Kim, all of Seoul, Rep. of Korea

Filed Dec. 29, 1987, Ser. No. 138,951

Claims priority, application Rep. of Korea, Jan. 9, 1987, 139/1987

Int. Cl.[4] B63B *43/12*

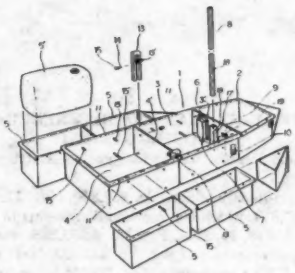
U.S. Cl. 114—360 **11 Claims**

1. A safety boat assembly having air bags which comprises:

a body member which includes a front cabin and a rear cabin disposed in the middle and rear portion of said body member, respectively, and a front chamber, disposed in the front portion of said body member,

a plurality of side chambers, attached to both sides of said body member, wherein said front chamber and said side chambers contain air bags disposed therein for improving the floating stability of the boat assembly,

a tubular pole, disposed in said front cabin and supported by a supporting member which is mounted to an interior wall between said front cabin and said front chamber, said tubular pole containing a dense material in the lower portion thereof for increasing the weight of the boat assembly so as to stabilize the boat assembly in heavy waves,



an air passing cylinder attached to said interior wall, wherein said air passing cylinder receives a tubular air inlet member for introducing fresh outside air from the atmosphere into the front cabin when the boat assembly is capsized, and

a light device attached to said interior wall for automatically lighting a light bulb by means of a gravity on/off switch which operates when the boat assembly is turned over, whereby the boat assembly reduces dangers associated with boating accidents and exhibits improved buoyancy and sailing stability.

4,802,436

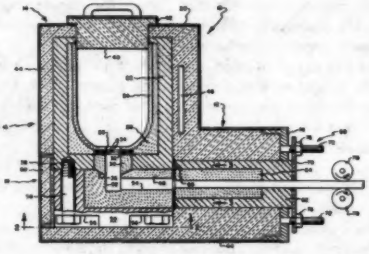
CONTINUOUS CASTING FURNACE AND DIE SYSTEM OF MODULAR DESIGN

Robert Wilson, Dundee, Scotland, and Jerry C. LaPlante, Buffalo, N.Y., assignors to Williams Gold Refining Company, Buffalo, N.Y. and Rautomead Limited, Dundee, Scotland

Filed Jul. 21, 1987, Ser. No. 76,022

Int. Cl.[4] B22D *11/00*

U.S. Cl. 164—440 **27 Claims**



1. A continuous casting furnace for use with metals capable of dissolving carbon, the furnace being of a modular construction utilizing a graphite metal containment system lined with suitable non carbon containing refractory materials; said furnace comprising:

a crucible assembly provided with a graphite crucible, and a refractory liner supported within the graphite crucible;

a die section including a tubular graphite die carrier, and a non-wetting refractory die disposed within the tubular graphite die carrier;

flexible sealing means extending between the die section and the crucible assembly; and

holding means capable of holding the parts together in juxtapositioned relationship.

4,802,437

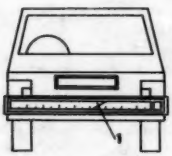
EXTERNAL SPEED DISPLAY DEVICE FOR MOTOR VEHICLES

Umberto Felicetti, Via Rossini, 8, 87040 Castrolibero (CS), Italy

Continuation of Ser. No. 752,429, Jul. 8, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 925,957

Int. Cl.[4] G01P *15/06;* **B60Q** *1/54, 9/00*

U.S. Cl. 116—62.4 **6 Claims**



1. A device for indicating the speed of a vehicle and for registering the speed of a vehicle which is involved in a collision, comprising,

a box member mounted on the outside of a vehicle, said box member being substantially the size of a vehicle bumper,

means for recording vehicle speed in response to involvement of the vehicle in a collision, said recording means including a cylindrical tube member and a shaft, said cylindrical tube member being mounted on said box member and being visible to other motorists,

a first set of graduations for indicating vehicle speed, said graduations being marked in units of vehicle speed, said graduations being visible and extending lengthwise with respect to said box member, said graduations being provided on one of said members, said shaft having indicator means cooperating with said graduations to indicate vehicle speed

said cylindrical tube member being transparent and having a deformable inner layer,

said shaft being located inside the cylindrical tube member and having a raised external thread formed thereon, said shaft being rotatable relative to said tube member in response to changes in vehicle speed, said thread facing the deformable inner layer, said cylindrical tube member being movable against the thread in response to collision forces sustained by said cylindrical tube member, said external thread being capable of forming an indentation in said inner layer to register the vehicle's speed when a collision moves the inner layer against the thread.

4,802,438

CONTAINER COLLAR DOSAGE TIME INDICATOR AND CONTAINER

Antonia R. DeJonge, R.D. #1 Lilac Dr., Annandale, N.J. 08801

Filed Mar. 24, 1988, Ser. No. 173,243

Int. Cl.[4] B65D *55/22;* **G09F** *9/00*

U.S. Cl. 116—308 **16 Claims**

1. A medicine bottle, comprising:

(a) a container having a bottom, a side wall structure, with a shoulder section of said side wall structure tapering inwardly and upwardly towards a neck, a neck with a cross sectional area less than that of the side wall structure, said neck having a generally cylindrical configuration, a cap engagement means about said neck, an opening at the top of said neck, a circular flange about said neck below said cap engagement means, said circular flange having a specific outer diameter, and a fixed container marker located on said side wall structure;

(b) a cap capable of engagement with said cap engagement means of said container; and,

(c) a tapered collar having a top diameter and a bottom diameter wherein said top diameter is narrower that said bottom diameter, said top diameter being slightly less than

the outer diameter of said circular flange and said bottom diameter being less than the greatest width of said shoulder section, said tapered collar having been force and fitted over said flange and being held under said flange and rotatably resting on said shoulder section, and said tapered collar having serial indicia located on its outside for alignment with said fixed container marker for dosage time indication as said tapered collar is sequentially rotatable thereabout.

4,802,439

PRESSURE APPLYING MECHANISM POR FIXING ROLLERS OF A COPYING APPARATUS

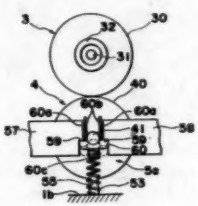
Yuji Sugimoto; Masaru Tsuji, both of Nara, and Shoichiro Yoshiura, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 4, 1987, Ser. No. 21,675

Claims priority, application Japan, Mar. 6, 1986, 61-32991; May 16, 1986, 61-112971

Int. Cl.[4] B05C *11/02*

U.S. Cl. 118—116 **1 Claim**



1. A pressure device for applying pressure between an upper fixing roller and a lower fixing roller of an image forming apparatus, said pressure device comprising:

a holding arm member for supporting a rotary shaft of said lower fixing roller at each end thereof, said holding arm member including a bearing portion and two vertical arm elements projecting from said bearing portion of said holding arm member such that said holding arm member substantially resembles a "U", each of said vertical arm elements having an inwardly protruding portion formed on an inner wall thereof, said inner walls of said arm elements facing each other such that said protruding portions prevent said rotary shaft of said lower fixing roller from being inadvertently detached from said holding arm member;

two horizontal stationary support plates located at each end of said lower fixing roller juxtapositioned to said rotary shaft adjacently disposed on respective sides of said vertical arm elements of said holding arm member, each support plate being provided with a shoulder portion substantially at the central portion thereof such that siad holding arm member is positioned between said support plates within said shoulder portions;

biasing means located immediately below said respective bearing portions of said holding arm members for biasing said holding arm members upward so that said respective holding arm members may be engaged with said respective shoulder portions of said support plates; and

means for preventing said biasing means from moving in a horizontal direction,

said pressure applying device being provided at each end of said lower fixing roller whereby said upper and lower fixing rollers are held in pressure contact with each other through depression of said upper fixing roller towards and with said lower fixing roller.

4,802,440

GLUE APPLICATOR FOR LABELING MACHINES

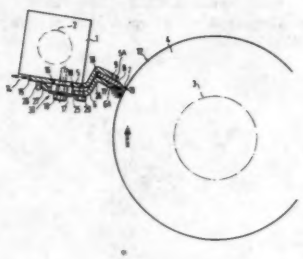
Hermann Kronseder, Regensburger Str. 42, D-8404 Worth-/Donau, Fed. Rep. of Germany

Filed Jul. 14, 1987, Ser. No. 72,903

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 8618988

Int. Cl.[4] B05C *1/02*

U.S. Cl. 118—261 **12 Claims**



1. A scraper device for regulating the thickness of a film of glue on a roller, said device comprising:

carrier means extending generally alongside of said roller and spaced from the periphery of said roller,

a support member and mounting means for mounting said support member to said carrier means for said member to be adjustable toward or away from said roller, said support member having stop surfaces thereon,

a glue scraper blade insert shaped for abutting said stop surfaces, said blade insert having at least one beveled scraper edge extending beyond said support member to provide a small gap between said edge and the periphery of said roller, and

a clamping member having a stop surface and means for mounting said clamping member to said support member to press the support member against said blade insert so as to hold said blade insert against said stop surfaces on the support member to assure that said blade insert is held in the same position when inserts are exchanged.

4,802,441

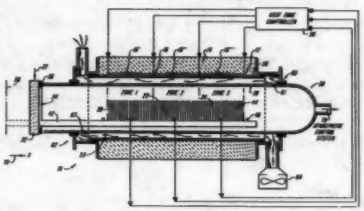
DOUBLE WALL FAST COOL-DOWN FURNACE

Arthur Wangh, Winchester, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

Filed Jan. 8, 1987, Ser. No. 1,444

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—666 **7 Claims**



1. A fast cool-down furnace, comprising:

a reaction vessel having an outer wall and defining an elongated reaction chamber having a length;

means coupled to the reaction vessel for heating the reaction chamber;

means coupled to the reaction vessel for injecting reactants in gas phase into the reaction chamber;

means for providing an annular fluid flow passageway having an annular mouth and that is in concentric surrounding relation to and extends substantially along the length of the reaction chamber;

means coupled to the annular fluid flow passageway for providing an annular duct in air-tight sealing relation to said mouth of said annular fluid flow passageway; and

means coupled to said annular duct for moving an annular stream of fluid peripherally around the mouth and through the passageway for removing heat uniformly from around the reaction chamber.

4,802,442

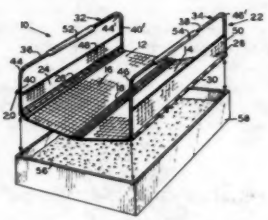
CAT LITTER SCREENING DEVICE

Michael E. Wilson, 818 Hayes, Apt. C, San Francisco, Calif. 94102

Filed Nov. 9, 1987, Ser. No. 118,171

Int. Cl.[4] A01K *29/00*

U.S. Cl. 119—1 **12 Claims**



1. A device for removing fecal matter from cat litter contained in a litter box, comprising the combination of at least two planar bottom panels, each panel having a pair of spaced-apart side edges and a pair of spaced-apart end edges which extend orthogonal to said side edges to form a generally rectangular configuration, means forming a plurality of screen-like foramen in each panel, said foramen being sized to permit passage therethrough of the litter while occluding passage of a substantial portion of the fecal matter, said bottom panels being positioned in side-by-side relationship with a side edge of one bottom panel being adjacent to a side edge of the other bottom

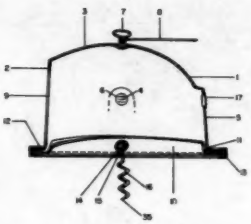
panel, hinge means for connecting said adjacent side edges of the panels together for pivotal movement about a central axis, lift means attached to each panel at the side edges thereof remote from the central axis for moving the panels down through the litter toward the bottom of the box, for lifting the panels up through the litter and away from the box while carrying fecal matter trapped by the foramen and for disposing of fecal matter carried by the panels, said end edges being coextensive with the plane of their respective bottom panel whereby when the device is tipped to move either of the end edges downwardly the discharge of fecal matter from the bottom panels over the end edges is unrestricted.

4,802,443

DOME SHAPED ANIMAL SHELTER

Henry M. Denmark, Raleigh, N.C., assignor to DAMCO Plastics Corporation, Raleigh, N.C.

Filed Oct. 1, 1987, Ser. No. 103,521
Int. Cl.[4] A01K *1/02*
U.S. Cl. 119—19 **12 Claims**



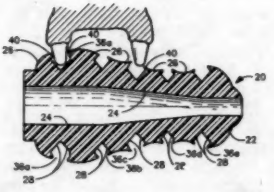
1. An animal shelter comprising:
a. a substantially dome-shaped housing having an opening for a door;
b. a separable base providing a floor for said housing;
c. means for attaching said housing to said base;
d. a swivel arm means attached at top of said housing;
e. a tether attached to said arm;
f. a spiral anchor means for anchoring said base to the ground, said means including a spiral anchor placed in the ground, said anchor having a loop at the top, an anchor bar held horizontally in place along center line of bottom of said base by holes located on opposite sides of said base, where said bar is placed through said loop of said anchor while being placed in said holes of said base, thereby holding the shelter in place.

4,802,444

THERAPEUTIC PET TOY

Joseph P. Markham, and Peter Emily, both of Lakewood, Colo., assignors to Bounce, Inc., Lakewood, Colo.

Filed Jul. 15, 1987, Ser. No. 73,484
Int. Cl.[4] A01K *15/00*
U.S. Cl. 119—29 **21 Claims**



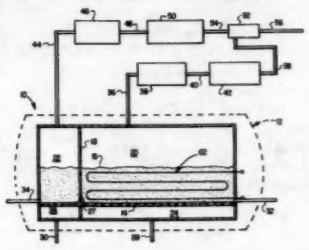
1. A dental hygienic play toy for performing dental prophylaxis on the teeth of a carnivore as said toy is chewed by the carnivore, said toy comprising:
an elastomeric elongated body having a longitudinal axis extending in the direction of said body's elongation, said body; defining an outer surface, a plurality of grooves extending circumferentially about said body and said longitudinal axis; formed in; said outer surface and having spaced sides, and a functional prophylaxis lip located between at least one of said sides of each groove and said toy's associated adjacent outer surface, said lip partially projecting over opening of the each groove and being sized and configured to scrape a tooth as it is inserted into and partially withdrawn from groove each as the carnivore chews said toy.

4,802,445

PARALLEL STAGED FLUIDIZED BED COMBUSTOR

Archibald S. Robertson, Jr., Whitehouse Station, N.J., assignor to Foster Wheeler Development Corporation, Livingston, N.J.

Filed May 12, 1988, Ser. No. 166,574
Int. Cl.[4] B09B *3/00*
U.S. Cl. 122—4 D **3 Claims**



1. A combustor comprising a vessel, means for dividing said vessel into two cells, means for passing air through a bed of particulate material including fuel disposed in each of said cells at a velocity sufficient to fluidize said particulate material and promote the combustion of said fuel, means for controlling the quantity of air introduced to one of said cells so that it is sufficient for complete combustion of the fuel in said latter cell to form a flue gas, means for controlling the quantity of air introduced to the other cell so that it is insufficient for complete combustion of said fuel but sufficient to generate a combustible off-gas, the flue gases from said combustion passing through said vessel and entraining a portion of said particulate material, outlets associated with said vessel for discharging said flue gas and said off-gas respectively, separating means respectively connected to said outlets for separating the entrained particulate material from said flue gases and from said off-gas, and means connected to said separators for burning said separated off-gas in the presence of said separated flue gases to raise their temperature.

4,802,446

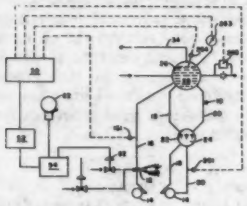
SAFETY DEVICE FOR SUBCRITICAL PRESSURE STEAM BOILERS

Leonard E. Triggs, 407 Kindt Corner Rd., Shoemakersville, Pa. 19555

Filed Apr. 27, 1987, Ser. No. 43,185
Int. Cl.[4] F22B *37/42*
U.S. Cl. 122—504 **4 Claims**

1. An improved subcritical pressure boiler with a heat source, a steam drum, inventory water, a plurality of risers, downcomers, headers and furnace tubes in combination comprising:
a. means for sensing saturation drum water temperature and generating a first signal therefor;

b. means for sensing temperature in the downcomer and to generate a second signal therefor;
c. means for finding the subtractive difference between the first signal and second signal;



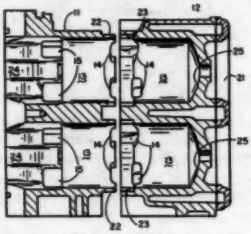
d. means for measuring a trend of the subtractive difference in a defined time interval;
e. means for diminishing the heat source if the subtractive difference approaches a defined limit in the defined time interval.

4,802,447

FOAM PATTERN FOR ENGINE CYLINDER BLOCK

William D. Corbett, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 17, 1985, Ser. No. 809,987
Int. Cl.[4] B22C 7/02
U.S. Cl. 123—65 K **3 Claims**



1. A foam pattern for use in a lost foam casting process for making a cylinder block of a crankcase compression, two-cycle engine, said cylinder block having a transfer passage extending through the cylinder block to connect a crankcase end of a cylinder with a transfer port in a wall of the cylinder, said transfer port positioned intermediate the crankcase and head ends of the cylinder, and having an exhaust port through the wall of the cylinder intermediate the ends of the cylinder, said pattern comprising:

(A) a first die cast pattern component for a head end of the cylinder block, said first component including a first cylinder cavity defining the head end of said cyinder and head ends of said transfer port and transfer passage, said first cylinder cavity being free of projections which would prevent the withdrawal of a forming die in a direction parallel to the axis of said cylinder;

(B) a second die cast pattern component for the crankcase end of the cylinder block, said second component including a transfer cavity defining crankcase ends of said transfer port and transfer passage, said transfer cavity being free of projections which would prevent the withdrawal of a forming die in a direction parallel to the axis of said cylinder; and

(C) a means to join said first and second components together,

wherein said second component further includes a second cylinder cavity defining a crankcase end of said cylinder,

wherein said second pattern component includes a cylindrical projection coaxial with and encircling a portion of said cylinder and said first pattern component includes a cylindrical cavity mating with said cylindrical projection,

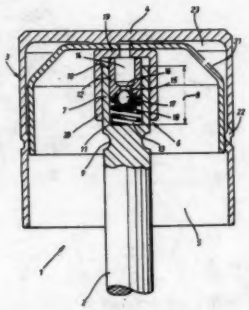
wherein the crankcase end of said transfer port is defined at the end of said cylindrical projection.

4,802,448

CUP TAPPET WITH HYDRAULIC PLAY COMPENSATION DEVICE

Erich Ableitner, Remseck, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 17, 1988, Ser. No. 156,607
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704929
Int. Cl.[4] F01L 1/24
U.S. Cl. 123—90.55 **9 Claims**



1. Cup tappet with hydraulic play compensation means for a breather valve of an internal-combustion engine having a cup open towards the breather valve, which cup exhibits a guide bushing arranged hub fashion to receive a hydraulic valve play compensating element having a hollow cylindrical part influencing the valve shank and a piston part guided slidably on the cylindrical part and braced, pretensioned by a spring against the cup base, said piston part and cylindrical part enclosing a working space which is connected through a non-return valve to a storage space which is connected through a duct in the cup to a lubricating oil circuit of the internal-combustion engine, wherein the valve shank is provided along a shank section, starting from the valve shank end, with a cylindrical recess which constitutes the cylindrical part, which is retained in the guide bushing secured internally to the cup base and which conjointly with the guide bushing encloses the storage space and working space.

4,802,449

"O"-TYPE ENGINE CONSTRUCTION

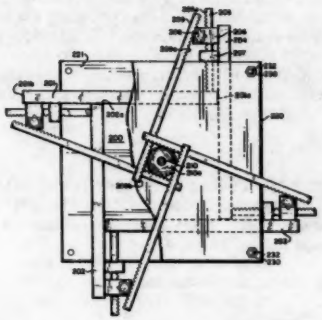
Ping Yang, 8220 Dorothy St., Rosemead, Calif. 91770

Continuation-in-part of Ser. No. 753,670, Jul. 10, 1985, Pat. No. 4,651,690, which is a continuation-in-part of Ser. No. 646,773, Sep. 4, 1984, abandoned. This application Dec. 8, 1986, Ser. No. 939,079
The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.
Int. Cl.[4] F01B 7/02
U.S. Cl. 123—197 R **13 Claims**

1. An internal combustion engine comprising:

a combustion chamber having two inner wall surfaces and at least three movable walls reciprocally mounted therein, each movable wall adapted to move simultaneously laterally and orthogonal with respect to each other, means associated with an exterior of each movable wall for

moving orthogonally while simultaneously causing each said movable wall to move laterally while moving orthogonally so as to maintain said combustion chamber in a continuously sealed condition, and means for collecting all orthogonal movements into one reciprocating linear movement and for transmitting such movement to a crankshaft;



ignition means secured in said combustion chamber adapted to selectively ignite a gas contained in said combustion chamber; and

means for permitting said gas to selectively enter into and exit from said combustion chamber.

4,802,450

BALANCER FOR INTERNAL COMBUSTION ENGINE

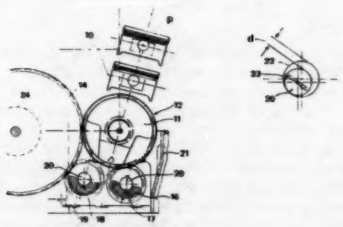
John M. L. Roberts, Coventry, United Kingdom, assignor to Triumph Motorcycles (Coventry) Limited, Hinckley, United Kingdom

Filed Feb. 20, 1987, Ser. No. 17,264

Claims priority, application United Kingdom, Feb. 22, 1986, 8604457

Int. Cl.[4] F02B 75/06; F16F 15/26

U.S. Cl. 123—192 B **5 Claims**



1. A motorcycle internal combustion engine which comprises four in line pistons and associated cylinders; a crankshaft driven by reciprocation of the pistons in the cylinders; drive transmission means for transmitting drive from the crankshaft; and balancing means for balancing secondary forces generated by the engine; the drive transmission means including a crankshaft gearwheel concentrically rotatable with the crankshaft about the crankshaft axis, and a primary gearwheel in direct driving engagement with the crankshaft gearwheel and arranged to carry drive clutch means; the balancing means including a first balancing wheel in direct engagement with the crankshaft gearwheel and a second balancing wheel in direct engagement with the primary gearwheel, whereby the balancing wheels are driven in opposite directions at twice the rotational speed of the crankshaft about axes parallel to the crankshaft axis; and further comprising adjustment means for each balancing wheel whereby the distance between the axis of rotation of the respective balancing wheel and the axis of rotation of its associated gearwheel is adjustable independently of the other balancing wheel.

4,802,451

MECHANICAL GOVERNOR FOR FUEL INJECTION PUMP, WITH REACTION FORCE ADJUSTING MECHANISM FOR GOVERNOR CONTROL LEVER

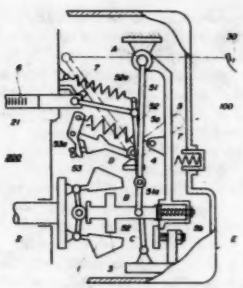
Masaatsu Takahashi, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1987, Ser. No. 65,335

Claims priority, application Japan, Jun. 30, 1986, 61-153753

Int. Cl.[4] F02M 39/00

U.S. Cl. 123—373 **5 Claims**



1. A mechanical governor for a fuel injection pump of an internal combustion engine having an accelerator pedal, said mechanical governor comprising:

a casing;

a governor control level mounted to said casing for pivotal movement about a pivotal axis between a first extreme angular position corresponding to a release position of said accelerator pedal and a second extreme angular position corresponding to a maximum depression position of said accelerator pedal;

first biasing means for biasing said governor control lever so as to gradually increase a reaction force acting thereupon as a function of the pivotal movement of said governor control lever from said first extreme angular position toward said second extreme angular position; and

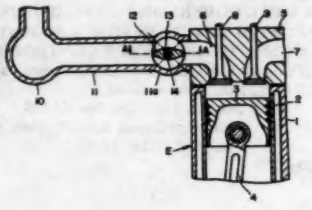
second biasing means having one end connected to said governor control lever and another end supported by said casing for applying a biasing force to said governor control lever so as to adjust the reaction force acting upon said governor control lever due to said first biasing means, said one end of said second biasing means being shifted in response to the pivotal movement of said governor control lever;

a link mechanism arranged between said another end of said second biasing means and said casing and connecting them to each other, said link mechanism being operative in response to the pivotal movement of said governor control lever about said pivotal axis for shifting said another end of said second biasing means relative to said casing, to substantially parallelly translate a line connecting said one and said another ends of said second biasing means to each other, across said pivotal axis of said governor control lever.

4,802,452
ENGINE INTAKE SYSTEM

Hiroshi Kanesaka, Kawasaki, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka and Kabushiki Kaisha Kanesaka Gijutsu Kenkyusho, Kawasaki, both of, Japan

Filed Aug. 28, 1986, Ser. No. 901,764
Claims priority, application Japan, Sep. 6, 1985, 60-195941
Int. Cl.[4] F02D 31/00
U.S. Cl. 123—376 8 Claims

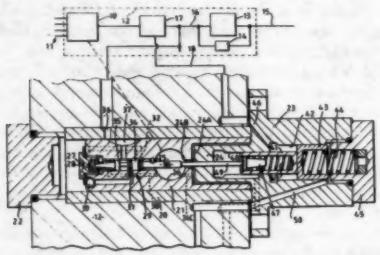


1. An intake system for an internal combustion engine, the system comprising: an intake passage having an intake port and an inertial supercharging intake pipe leading to the intake port; an intake valve mounted in said intake port and operatively connected to said engine for alternately opening and closing the intake port; a rotary valve operatively connected to the engine and disposed in the intake passage intermediate said inertial supercharging intake pipe and said intake port, said rotary valve being rotatable for opening and closing the intake passage, and timing adjusting means operatively connected to said engine and to said rotary valve for retarding the opening of the rotary valve relative to the opening of the intake valve at low engine speeds, and for advancing the opening of the rotary valve at high engine speeds, whereby the retarding and advancing of the opening of the rotary valve enables inertial supercharging in the intake pipe at both low and high engine speeds.

4,802,453
FUEL INJECTION PUMP

Ian R. Thornthwaite, Gillingham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jul. 27, 1987, Ser. No. 77,809
Claims priority, application United Kingdom, Aug. 16, 1986, 8619994
Int. Cl.[4] F02M 41/14, 37/06; F04B 29/00
U.S. Cl. 123—450 12 Claims

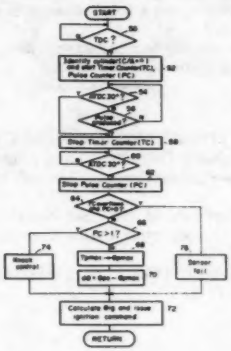


1. A fuel injection pump for supplying fuel to an internal combustion engine comprising a pumping plunger located in a plunger bore, cam means and a cam follower means, a drive shaft coupled to one of said means for driving the cam means and cam follower means relative to each other to impart inward movement to the plunger, a fluid pressure operable device for effecting limited movement of the other of said means about the axis of rotation of the drive shaft, said device comprising a piston slidable within a cylinder, means coupling the piston to the other of said means, a control valve member slidable within a bore defined in the piston, passage means through which the opposite ends of said control valve member are exposed to a low pressure, port means opening into said bore and controlled by the valve member whereby when the valve member is moved in one direction fluid can flow to one end of the cylinder to move the piston in the same direction to re-establish an equilibrium position and when the valve member is moved in the other direction fluid can flow out of said one end of the cylinder to allow the piston to move in the other direction until the equilibrium position is re-established, and means responsive to a control pressure for controlling the position of said valve member.

4,802,454
DEVICE FOR CONTROLLING IGNITION TIMING IN INTERNAL COMBUSTION ENGINE

Akira Tanaka, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1987, Ser. No. 10,875
Claims priority, application Japan, Feb. 19, 1986, 61-34330
Int. Cl.[4] G01L 23/22; F02P 5/145
U.S. Cl. 123—425 12 Claims



1. A device for controlling ignition timing in a multi-cylindered internal combustion engine, comprising:

(a) pressure sensors disposed in the vicinity of each combustion chamber of the engine for detecting pressure variation in the chamber;

(b) a crankshaft angle sensor disposed in the vicinity of a rotating member of the engine for detecting the angular position of the crankshaft;

(c) filtering means connected to the pressure sensors, said filtering means for passing pressure sensor output signals in a transmission band extending up to and including knocking frequencies;

(d) pulse generating means connected to the filtering means for generating a pulse at every peak output by the pressure sensors;

(e) knocking and maximum pressure angle detecting means, connected to the pulse generating means, said knocking and maximum pressure angle detecting means for counting each pulse generated by said pulse generating means and for determining that knocking has occurred when the number of counted pulses exceeds a predetermined value, and said knocking and maximum pressure angle detecting means, being further connected to the crankshaft angle sensor, for determining the maximum pressure angle at which the combustion chamber pressure becomes maximum based upon the detected angular position of the crankshaft and based upon the counted pulses;

(f) ignition timing calculating means, connected to the knocking and maximum pressure angle detecting means and crankshaft angle sensor, for separately calculating ignition timing of the engine for each combustion chamber, said ignition timing calculating means retarding the ingition timing when knocking is detected and said ignition timing calculating means calculating the deviation of the maximum pressure angle from a predetermined target angle and compensating the ignition timing to decrease the deviation when knocking is not detected; and

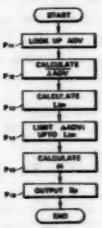
(g) ignition means connected to the ignition timing calculating means for igniting a fuel and air mixture in each combustion chamber.

4,802,455

KNOCKING CONTROL SYSTEM AND METHOD FOR AN INTERNAL COMBUSTION ENGINE

Toshimi Abo, Kanagawa, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Oct. 14, 1986, Ser. No. 918,123
Claims priority, application Japan, Oct. 29, 1985, 60-243606
Int. Cl.[4] F02P 5/145
U.S. Cl. 123—425 **9 Claims**



1. A knocking control system for a multi-cylinder engine comprising:

(a) first means for detecting engine operating conditions;

(b) second means for detecting the occurrence of knocking in each of the engine cylinders;

(c) third means for setting a basic advance angle value for ignition timing on the basis of the engine operating conditions detected by said first means;

(d) fourth means for calculating an angle correction amount for each engine cylinder by which the basic advance angle value set by said third means is to be adjusted toward the retarded-ignition side so as to suppress knocking when knocking is detected by said second means and toward the advanced-ignition side when said second means detects no knocking;

(e) fifth means for calculating a limit value for the angle correction amounts calculated by said fourth means on the basis of an average value of the angle correction amounts for all cylinders and limiting said angle correction amounts to no more than said limit value;

(f) sixth means for correcting the basic advance angle value set by said third means for each cylinder according to the angle correction amount for the corresponding cylinder calculated by said fourth means and limited by said fifth means and determining a final advance angle value for each cylinder from the correction thereof; and

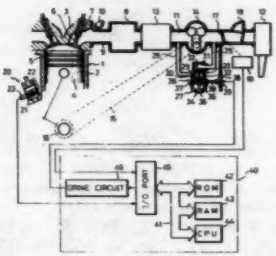
(g) seventh means for ignition an air-fuel mixture supplied to each engine cylinder on the basis of the final advance angle value for that cylinder.

4,802,456

DEVICE FOR CONTROLLING CHARGING PRESSURE OF A SUPERCHARGED INTERNAL COMBUSTION ENGINE

Yukihiro Okane; Koji Endo, and Masayoshi Nakai, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 14, 1987, Ser. No. 73,284
Claims priority, application Japan, Aug. 15, 1986, 61-190559
Int. Cl.[4] F02B 33/38; F02D 23/00
U.S. Cl. 123—564 **8 Claims**



1. A device for controlling charging pressure of an internal combustion engine having an intake passage, said device comprising:

a throttle valve arranged in the intake passage;

a mechanically driven charger driven by the engine and arranged in the intake passage downstream of said throttle valve;

a bypass passage branched from the intake passage between said throttle valve and said mechanically driven charger and connected to the intake passage downstream of said mechanically driven charger;

a pressure source having a pressure which is not less than atmospheric pressure;

speed detecting means for producing an output signal indicating an engine speed;

relief valve means arranged in said bypass passage and having a pressure control chamber selectively communicating under the control of a control means with one of said pressure source and the intake passage between said throttle valve and said mechanically driven charger, said relief valve means opening and closing in response to charging pressure and controlling a maximum charging pressure in the intake passage downstream of said mechanically driven charger by controlling a flow area of said bypass passage in response to an absolute pressure in said pressure control chamber to reduce said maximum charging pressure as said absolute pressure is reduced, said relief valve means being opened when the charging pressure exceeds a pressure which is determined in response to the absolute pressure in the pressure control chamber thereby controlling the flow area of the relief valve means to equalize the charging pressure with the charging pressure determined by the absolute pressure in the pressure control chamber, said relief valve means having a construction such that, if the pressure control chamber is connected to the intake passage between the throttle valve and the mechanically driven charger, the relief valve is closed when the engine speed is lower than a first speed and opened when the engine speed exceeds the first speed to control the flow area of the relief valve means so that the charging pressure becomes equal to the charging pressure determined by the level of vacuum in said pressure control chamber; and

said control means selectively connecting said pressure control chamber to said pressure source or the intake passage between said throttle valve and said mechanically driven charger in response to the output signal of said

speed detecting means to connect said pressure control chamber to said pressure source when the engine speed is lower than a second predetermined speed that is higher than the first speed and to connect said pressure control chamber to the intake passage between said throttle valve and said mechanically driven charger when the engine speed is higher than said second predetermined speed.

4,802,457

INTERNAL COMBUSTION ENGINE PROVIDED WITH A SUPERCHARGER

Johnny Oscarsson, Gustavsberg, Sweden, assignor to Svenska Rotor Maskiner AB, Stockholm, Sweden

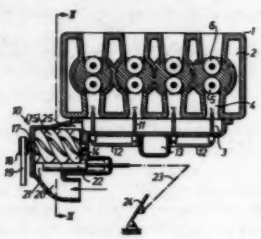
PCT No. PCT/SE86/00467, § 371 Date May 14, 1987, § 102(e) Date May 14, 1987, PCT Pub. No. WO87/02417, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 10, 1986, Ser. No. 54,274

Claims priority, application Sweden, Oct. 14, 1985, 8504744

Int. Cl.[4] F02B *33/36*; F02D *23/02*

U.S. Cl. 123—564 **8 Claims**



1. A throttle controlled internal combustion engine (1, 2) comprising:

a supercharger in the form of an air compressor (10), said air compressor comprising intermeshed helical screw rotors (14, 15) arranged in a compression chamber;

said air compressor (10) having a capacity regulating means (22) on an air inlet side (20) thereof;

control means coupled to said capacity regulating means (22) for regulating the power output of the engine, said control means including movable means for assuming positions corresponding to a partial engine load for adjusting said capacity regulating means (22) to corresponding positions in which the function of said air compressor (10) is switched to an expander mode with variable throttling effect on the sunction inlet side (3) of the engine and substitutes for a gas throttle, said air compressor (10) in said expander mode transferring power to the engine (1, 2); and

said capacity regulating means including a valve slide means (22) arranged for axial movement in relation to said rotors (14, 15) and forming a movable wall part of said compression chamber of said air compressor (10), and also forming a movable wall part of a radial inlet port means (21), said radial inlet port means including a nozzle means (30) of variable area, said nozzle means (30) communicating with a fuel delivery means (31).

4,802,458

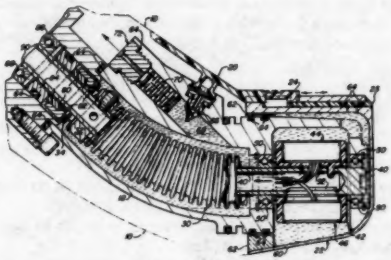
DUAL FUNCTION ULTRASONIC TRANSDUCER PROBES

Phillip M. Finsterwald, West Haven, Conn.; Charles W. Howlett, Bailey, Colo., and James W. Ring, Southbury, Conn., assignors to Ethicon, Inc., Somerville, N.J.

Filed Mar. 9, 1984, Ser. No. 588,021

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—661.08 **5 Claims**



3. An ultrasonic transducer probe comprising:

a motor having a first shaft;

an ultrasonic transducer mounted on a second shaft;

a flexible coupling connecting said first and second shafts;

wherein said ultrasonic transducer, said first shaft and said flexible coupling are surrounded by a fluid chamber; and

a dynamic fluid seal located around said first shaft.

4,802,459

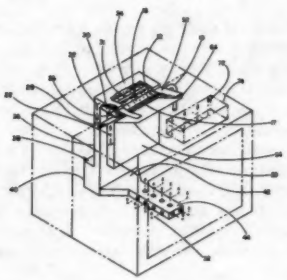
IMPROVED GAS OVEN USING FLAME SWITCHING

David H. McFadden, Lexington, and W. David Lee, W. Newton, both of Mass., assignors to Gas Research Institute, Chicago, Ill.

Filed Dec. 21, 1987, Ser. No. 135,932

Int. Cl.[4] F24C *3/00*

U.S. Cl. 126—41 R **16 Claims**



2. A flame switchable gas burning device for use as a radiant and a convection heat source in a gas stove having an oven cavity therein said device comprising:

a burner tube having a plurality of front-facing flame ports thereon,

means for substantially directing fresh air through an upper and a lower gap proximate to said burner tube over substantially the length of said burner tube;

means for creating a low pressure zone over the length of said burner tube above and rearward of said burner tube, said low pressure zone adequate in size to allow the passage therethrough of a flame which will emanate from said flame ports when said burner tube is appropriately

connected to a source of gas and is appropriately ignited and said means for creating a low pressure zone also causing recirculation air to flow from said low pressure zone into said oven cavity.

means for activating and deactivating said means for creating a low pressure zone thereby causing said flame to switch from bake to broil when said means for creating a low pressure zone is deactivated;

a broil flame channel within which a broil flame from said flame ports is contained when said means for creating a low pressure zone is deactivated, comprising a spreader plate having a width substantially equal to the length of said burner tube and appropriately positioned above said burner tube and associated with said low pressure zone so as to permit a flame from said flame ports to enter said low pressure zone, when said low pressure zone is present, without substantially impinging onto said spreader, and a shield plate having a width substantially equal to the width of said spreader plate, one end positioned appropriately below said burner tube and in association with said lower gap and sloping upwardly and toward said spreader plate thereby creating said broil flame channel and having a front-facing broil flame channel opening with a height dimension less than the rearward spacing between said spreader and said shield, said broil flame distributed over and attached to said shield plate; and

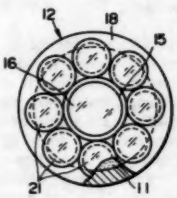
means for attaching said gas burning device to the roof surface of said oven cavity.

4,802,460

ENDOSCOPE ILLUMINATING OPTICAL SYSTEM DEVICE

Hideki Ohkuwa, and Akira Hasegawa, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1987, Ser. No. 56,832
Claims priority, application Japan, Jun. 6, 1986, 61-131463
Int. Cl.[4] A61B 1/06
U.S. Cl. 128—6 **18 Claims**



1. An endoscope illuminating optical system device comprising:

a light guide inserted through an insertable part of an endoscope said light guide having an exit end surface and transmitting an illuminating light to an observing means; and

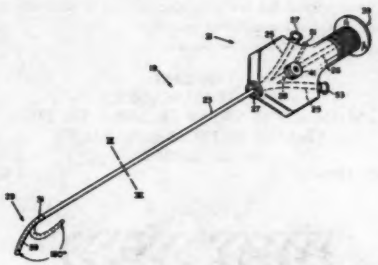
an illuminating optical member arranged in a position opposed to the exit end surface of said light guide, said illuminating optical member having a plurality of lens parts arranged so that the cross-section of said lens parts taken as a whole is substantially of the same shape and size as the cross-section of the exit end surface of said light guide and distributing the illuminating light projected out of the exit end surface of said light guide to an object to be observed.

4,802,461

RIGID ENDOSCOPE WITH FLEXIBLE TIP

George Cho, Sudbury, Mass., assignor to Candela Laser Corporation, Wayland, Mass.

Filed Aug. 26, 1987, Ser. No. 89,579
Int. Cl.[4] A61B 1/30
U.S. Cl. 128—7 **39 Claims**



1. An endoscope comprising:

a tube having (i) a length which is sufficiently rigid such that the tube is evenly displaced along its length through axial and rotational translation by maneuvering one end of the tube, and (ii) a tip portion at an opposite end of the tube having an outer diameter of less than about 3 mm and a length of up to about 12 cm and comprising a notched plastic tubing, the tip portion being selectively flexible up to about 180° relative to the length by user control while maintaining the length substantially stationary; and

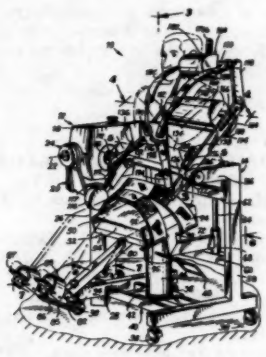
means for laterally moving the tip portion relative to the length of the tube.

4,802,462

MUSCLE EXERCISE AND REHABILITATION APPARATUS FOR THE UPPER LUMBAR REGION

James M. Reiss, Setauket; Walter Gezari, New York, and Robert Stidd, Center Moriches, all of N.Y., assignors to Biodex Corporation, Shirley, N.Y.

Filed Dec. 21, 1987, Ser. No. 136,017
Int. Cl.[4] A61H 1/02
U.S. Cl. 128—25 R **26 Claims**



1. A back attachment for a muscle exercise and/or rehabilitation apparatus of the type having a motor driven output shaft with a central axis, said back attachment comprising:

seat means for supporting a person thereon;

back exercising means connected to said output shaft for

pivoting the back of the person about said central axis when said person is supported on said seat means;

support means for supporting said set means at a downward angle of approximately 15 degrees toward a front portion of said seat means, regardless of the angle of pivot of said back exercising means; and

said back exercising means being pivotally connected to said support means along a pivot axis in line with said central axis;

securing means for securing the person to said seat means and said back exercising means.

4,802,463

FOOT MASSAGER

Teresa M. Rojas, 9715 NW. 6th La., Miami, Fla. 33172

Filed Oct. 26, 1987, Ser. No. 112,952
Int. Cl.[4] A61H 1/00
U.S. Cl. 128—36 4 Claims

1. A foot massaging device, comprising:

A. a platform member having substantially the shape of the sole of a foot and being made of a substantially resilient material, and said platform member further including an upperside and an underside;

B. motor means for producing vibrations rigidly mounted to said platform member;

C. first cushion means for cushioning positioned on said upperside and having substantially the same projected dimensions as said platform member;

D. second cushion means for cushioning positioned on said underside and having substantially the same projected dimensions as said platform member;

E. battery means for providing electricity and connected to said motor means;

F. an upper member covering said first and second cushion means for cushioning and urging them towards the sole of the user's foot; and

G. a plurality of vibration transmitting means rigidly mounted to the upperside of said platform and covered by said first means for cushioning;

said vibration transmitting means comprises a tubular section made out of a substantially flexible material so that the user's sole does not come in contact with an uncomfortably hard object if the user applies his weight on said transmitting means.

4,802,464

TRACTION DEVICE FOR OPERATING TABLES AND ORTHOPAEDIC SURGERY APPARATUS FOR SURGICAL OPERATIONS

Roland Déprez, Gentilly, France, assignor to Marzet-Aubry, Gentilly, France

Filed Apr. 2, 1987, Ser. No. 33,992
Claims priority, application France, Apr. 3, 1986, 0604786
Int. Cl.[4] A61F 5/00
U.S. Cl. 128—71 9 Claims

1. A traction device for operating tables and orthopaedic surgery comprising:

a frame defining a median vertical plane,

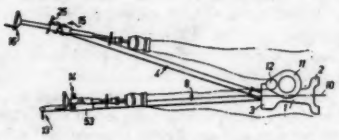
a first arm being a central traction arm,

a second arm being a central counter-extension arm,

each of said arms being provided with traction means and means for locking said arms in position,

means mounting said first arm on said frame for both horizontal movement around a first axis in said median plane and for vertical movement around a second axis perpendicular to said median plane,

means mounting said second arm on said frame for only horizontal movement around a third axis in said median plane,



a pelvis support,

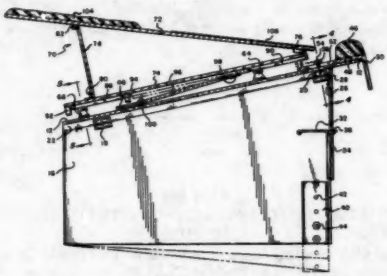
and means mounting said pelvis support on said frame for adjustment laterally with respect to said median plane.

4,802,465

RECLINING TRACTION LOUNGE

Bernie L. Slagle, 29 Allenwood Estates, Vincentown, N.J. 08088

Filed Dec. 13, 1985, Ser. No. 808,759
Int. Cl.[4] A61F 5/00
U.S. Cl. 128—71 10 Claims



1. A reclining traction lounge comprising:

a frame having a front and a back and adapted to rest on the floor, said frame including an upper frame surface inclined downwardly from the front to the back at an angle of between approximately 10° to about 40° below the horizontal;

means carried by said frame adjacent the front of the upper frame surface for supporting a person's knees;

a body support means including a body support surface, said support surface being substantially planar and extending from a point adjacent said knee supporting means rearwardly and upwardly at an angle of between approximately 0° to about 30° above the horizontal, the length of said body support surface being sufficient to underlie the upper thighs, buttocks, back and head of a person lying thereon;

means, located between said body support means and said upper frame surface for allowing relatively free limited movement of said body support means rearwardly and forwardly along said upper frame surface, said body support means being movable relative to said knee supporting means;

means for temporarily maintaining said body support means in a forward position;

means for releasing said maintaining means to allow said body support means to move rearwardly while a person is lying on the lounge, said releasing means being located adjacent one side of said body support means so as to be readily accessible to and manually operable by said person lying on said lounge;

said body support surface having a padded non-slip surface formed thereon adjacent the upper portion thereof

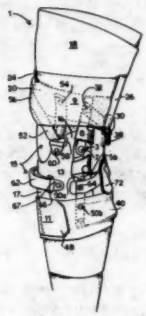
adapted to underlie the person's head and shoulders, said body support surface also having a slippery portion thereon in the area adapted to underlie the person's buttocks.

4,802,466

LIGHTWEIGHT, COMPACT ORTHOTIC DEVICE FOR CONTROLLING KNEE INSTABILITIES

Andrew H. Meyers, 31 The Birches, Roslyn Estates, N.Y. 11576, and Jeffrey Minkoff, New York, N.Y., assignors to Andrew H. Meyers, Roslyn Estates, N.Y.

Filed Apr. 14, 1987, Ser. No. 38,048
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—80 C **14 Claims**



1. An orthotic device for controlling knee instabilities, comprising:

a. a joint structure;

b. an upper support assembly including side portions and an anterior portion, and a lower support assembly for circumscribing the leg above and below the kneejoint and connected to the joint structure for supporting the joint structure over the kneejoint;

c. a condyle pad assembly having an upper portion for engaging one of the condyle regions of the kneejoint; and

d. mounting means including a resilient strap for applying a lifting force on the upper portion of the condyle pad assembly and a D-ring means connected to the upper portion of the condyle pad assembly, wherein one end of the resilient strap is connected to the side portion of the upper support assembly that lies above the condyle region of the kneejoint, the other end of the resilient strap is connected to the anterior portion of the upper support assembly, while a middle portion of the resilient strap pulls the upper portion of the condyle pad assembly both upwardly and laterally to resiliently maintain the upper portion of the condyle pad assembly in intimate supporting contact with the condyle region throughout the range of pivotal movement of the kneejoint.

4,802,467

BI-CENTRIC KNEE JOINT SUPPORT

Timothy Pansiera, 1050 NW. First Ave., Boca Raton, Fla. 33432

Filed May 9, 1988, Ser. No. 191,508
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—88 **5 Claims**

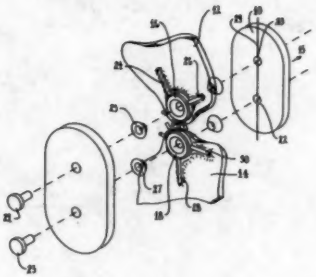
1. A bi-centric joint for an orthotic support device having proximal and distal members, the joint comprising:

(a) planar base means having a first aperture and a second aperture, said planar base means having a longitudinal centerline;

(b) a first hub, said hub being rotationally secured to said planar base means through said first aperture, said first aperture thereby defining an axis of rotation of said first hub, said first hub being integral to said proximal member along a peripheral edge of said first hub thereof;

(c) a second hub, said second hub being rotationally secured to said planar base means through said second aperture, said second aperture thereby defining an axis of rotation of said second hub relative to said planar base, said second hub being integral to said distal member along a peripheral edge of said second hub thereof, said centerline passing through said rotational axes;

(d) a plurality of spaced apart tubular radial spokes projecting radially outwardly from said first hub in the direction of said second hub; and



(e) a plurality of spaced apart tubular radial spokes projecting radially outwardly from said second hub in the direction of said first hub, said respective pluralities of tubular radial spokes being in interdigitating relationship to each other, said spokes upon rotation of said hub sequentially passing in alignment with said centerline, each of said tubular spokes having a length such that, when each spoke is in alignment with said centerline, such spoke will penetrate a peripheral edge of said proximal or distal member to which the hub of such spoke is not rigidly secured,

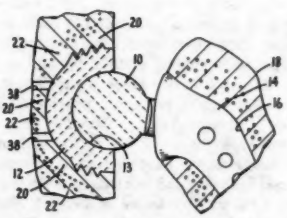
whereby a particular characteristic of relative movement between said first and second hubs, in the nature of a simulation of naturally occurring movement of a human joint, is obtained by the above combination of elements.

4,802,468

DEVICE FOR CUTTING THREADS IN THE WALLS OF THE ACETABULAR CAVITY IN HUMANS

Roy Y. Powlan, 1 Chapel Dr., Lafayette, Calif. 94549

Continuation-in-part of Ser. No. 653,096, Sep. 24, 1984, Pat. No. 4,611,587. This application Aug. 22, 1986, Ser. No. 899,162
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 V **6 Claims**



1. A device for cutting threads in the wall of the acetabular cavity, said device comprising:

(a) a rotatable cutting head shaped to substantially conform

to the shape and size of the acetabular cavity and having a longitudinal opening therein,

(b) a cutting tool located within the cutting head and having a rotatable cutting tool bit extending exteriorly of said cutting head through the opening,

(c) power means for rotating said cutting tool bit, and

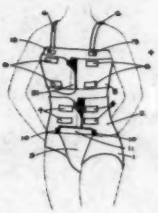
(d) means for driving the cutting tool bit in a spiral path so as to cut threads in the wall of the acetabular cavity.

4,802,469

THERAPEUTIC BODY SUIT

Maria Gollestani, P.O. Box 2388, Kailua-Kona, Hi. 96745

Filed Aug. 3, 1987, Ser. No. 80,985
Int. Cl.[4] A61F 5/24
U.S. Cl. 128—98.1 7 Claims



1. A body suit providing therapeutic pressure for post-surgical or other medical uses comprising:

(a) at least one section of flat breathing elastic material joined together to surround the abdominal areas below the shoulders, and to further cover the body from the breasts and upper back to the lower crotch, with openings for the legs to depend through;

(b) shoulder straps for shoulder and breast support;

(c) two separable crotch bottom ends with each end having attached to it an attachment base where the base of the first end may be attached or separated from the base of the second end;

(d) the upper front and rear of the body suit having firmly attached to one of the interior and the exterior; attachment bases for removable attachment of a breast supporting brassiere;

(e) the central front and back of the body having firmly mounted at least one attachment base to provide removable attachment of an elastic waist binding;

(f) the front and rear lower waist areas of the body suit having firmly attached at least one attachment base to provide removable attachment of a crotch supporting binding; wherein said attachment bases permit tandem use of the crotch binding independently of an elastic waist binding;

(g) an elastic waist binding constructed of flat breathing elastic material with attachment bases fixed to the rear interior back area which contact and attach to the attachment bases located on the central back of the body suit; the elastic waist binding further having one attachment base fixed to each of its two ends which connect to each other in an adjustable manner to provide additional pressure above and beyond that provided by the body suit, but in tandem with the body suit to the abdominal area it surrounds; the elastic waist binding further having attachment bases fixed to it and located at the lower central front and rear areas for attachment of a crotch binding;

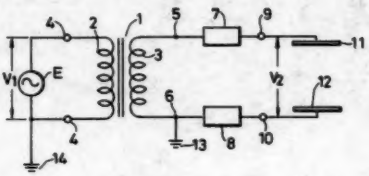
(h) a crotch binding constructed of flat breathing elastic materials which is wider at its ends and tapers towards its center; the crotch binding ends having attachment bases mounted thereon for removable attachment to the elastic waist binding.

4,802,470

ELECTRIC FIELD THERAPY APPARATUS

Akikuni Hara, and Yukio Ogawa, both of Tokyo, Japan, assignors to Hakuju Institute For Health Science Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 655,092, Sep. 27, 1984, abandoned. This application Mar. 2, 1987, Ser. No. 22,529
Int. Cl.[4] A61N 1/00
U.S. Cl. 128—24.1 4 Claims



1. An electric field therapy apparatus for treatment of the human body and the like, said apparatus comprising:

a pair of spaced apart electrodes having a spacing therebetween that is large enough to receive a body part to be treated;

terminal means for connecting said apparatus to a commercial power source of alternating current of a predetermined frequency;

a transformer, having a primary winding connected across said terminal means and a secondary winding connected at two spaced apart points on said secondary winding to respective electrodes of said pair of electrodes, for boosting the voltage of said power source to provide a very high voltage of said predetermined frequency across said electrodes; and

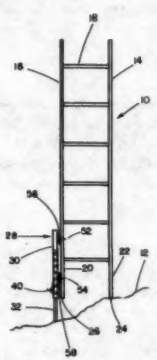
means for connecting a third point on said secondary winding, located between said two spaced part points, to ground.

4,802,471

LEVELER ATTACHMENT FOR LADDERS

James E. Cordell, 42 Florida Pl., Asheville, N.C. 28806

Filed Feb. 3, 1988, Ser. No. 162,158
Int. Cl.[4] E06C 7/44
U.S. Cl. 182—204 11 Claims



1. An improved ladder comprising:

first and second substantially parallel support beams;

a plurality of spaced apart rungs connected between said support beams forming steps of said ladder;

a leveler connected to one of said support beam; said leveler

including an elongated bar adapted to slide relative to one of said beams; said bar acting as one of the legs of said ladder when said ladder is on an uneven surface; said leveler having at least one substantially smooth surface; said leveler including a gripping device having a sharp edge; said sharp edge of said gripping device selectively engaging said substantially smooth surface for holding said bar at a fixed position and for permitting said bar to freely slide past the end of said one of said beams when said sharp edge is not engaging said substantially smooth surface so as to level the ladder; said leveler including an outer rail and an inner rail; said outer rail connected to one of said beams; said inner rail being slidable and including said smooth surface; said gripping means connected to said outer rail; said gripping means is substantially T-shaped; an opening in said outer rail; a portion of said gripping means extending through said opening in said outer rail.

4,802,472

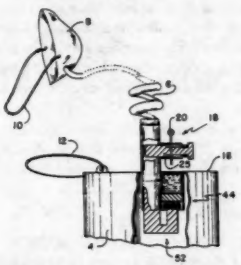
EMERGENCY AIR SUPPLY DEVICE

Sakun J. Jung, 325 Hammonton Pl., Silver Spring, Md. 20904

Filed Oct. 8, 1987, Ser. No. 105,617

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.18 **10 Claims**



1. An air supply device comprising:

a tank for holding air, said tank having an outlet therein;

activation means for permitting release of said air from said tank through said outlet, said activation means comprising,

a movable blocking element for closing said outlet, said blocking element being movable from a closed position wherein said outlet is closed to an open position wherein said outlet is opened and wherein release of air from said tank is permitted,

means for urging said blocking element from said closed position to said opened position, and

means for holding said blocking element in the closed position, said means for holding being removable such that said means for urging is permitted to move said blocking element to said opened position to permit said release of air;

regulation means for regulating the flow of air from said tank during said release of air, said regulation means comprising,

a hollow element connected to said outlet, said element having a plurality of generally, longitudinally aligned ports therein such that said air in said tank is in communication with said outlet,

movable valve means for opening and closing a plurality of said ports, said movable valve means comprising a U-shaped valve stem having an end portion enclosed by said hollow element, said end portion of said valve stem being reciprocable to sequentially open and close said plurality of generally, longitudinally aligned ports,

means for urging said valve means to a position closing a majority of said ports, and

expansion means for overcoming said means for urging in order to move said valve means to various positions wherein successively more ports are opened, said expansion means being responsive to pressure of said air in said tank such that as air is removed form the tank, said valve means is moved to open more ports in order to maintain a substantially constant flow of air; and

means for furnishing air to a user from said tank when said activation means permits release of said air.

4,802,473

FACE MASK WITH EAR LOOPS

Vance M. Hubbard, Euless, and Welton K. Brunson, Bedford, both of Tex., assignors to Tecnol, Inc., Fort Worth, Tex.

Continuation of Ser. No. 549,392, Nov. 7, 1983, abandoned. This application Dec. 31, 1985, Ser. No. 815,753

Int. Cl.[4] A62B *7/10*

U.S. Cl. 128—206.19 **1 Claim**

1. A face mask, comprising:

a generally rectangular layer of thermoplastic polymeric micro-fiber material adapted for disposal over the nostrils and mouth of a wearer;

first and second ear loops each fabricated from a thin strip of elastically deformable heat malleable material that has two free ends, the material of said ear loops consisting of 90.33 percent of 78 Denier texturized polyester and 9.67 percent of 40 Denier lycra spandex and allowing for high frequency heat bonding thereof; and

each of said loops having the free ends thereof attached proximate a corner of said fabric layer on one of the vertical sides thereof by a high frequency heat formed seal such that the integrity of said micro-fiber layer is maintained by not invasively attaching the free ends of said loops thereto.

4,802,474

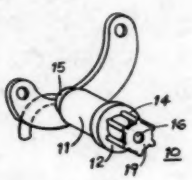
PROTECTIVE COVER FOR TRACHEOTOMY TUBE

Katherine K. Beevers, 11075 Montana Ave., Boise, Id. 83704

Filed Sep. 4, 1987, Ser. No. 93,311

Int. Cl.[4] A01M *16/00*

U.S. Cl. 128—200.26 **2 Claims**



1. A protective cover for a tracheotomy tube comprising:

a collar adapted in size and shape to fit over and frictionally engage the end of the tracheotomy tube;

an end plate in spaced relation with said collar;

a plurality of cage bars interconnecting said end plate and collar, said plurality of cage bars aligned in parallel cylindrical spaced relationship, and further, spaced at sufficient

intervals to permit the insertion of a standardized aspirating tube between any two cage bars;

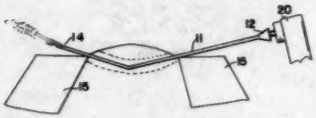
a surface flange integral with said frictional engagement means and said inhalation prevention means, adapted in size and shape to cover the annular space between said frictional engagement means and the surrounding tissue of the wearer's neck.

4,802,475

METHODS AND APPARATUS OF APPLYING INTRA-LESIONAL CRYOTHERAPY

Ahmed H. A. G. Weshahy, 11 Harrun St., Dokki, Cairo, Egypt

Filed Jun. 22, 1987, Ser. No. 64,619
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 21 Claims



1. A method of applying intra-lesional cryotherapy, comprising the steps of:

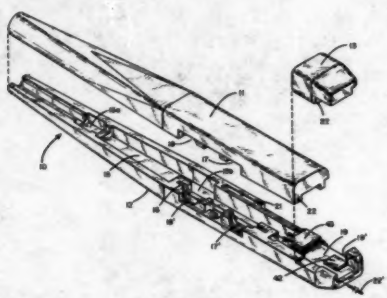
inserting a hollow thermally conductive needle having a front opening through the skin of a patient with said needle having a given surface portion adapted to position the same at a given depth according to the location of a lesion to cause said front opening of the needle to protrude from the patient's skin when said given portion is in position and applying a cryogen through the internal hollow of said needle to cause said given portion to freeze tissue in the area of said lesion while said cryogen is being discharged from said front opening of said needle.

4,802,476

ELECTRO-SURGICAL INSTRUMENT

Marc D. Noerenberg, Shakopee, and Peter Stasz, Minneapolis, both of Minn., assignors to Everest Medical Corporation, Brooklyn Center, Minn.

Filed Jun. 1, 1987, Ser. No. 56,434
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.14 10 Claims



1. An electro-surgical tool having a cutting mode of operation, coagulating mode of operating, switch means for altering the mode of operation between the cutting mode and the coagulating mode, a handle member, an improved blade, means associated with said handle member for retaining said blade in fixed registration with respect to said handle member while establishing an electrical connection with said switch means, electrical-to-mechanical transducer means for vibrating said blade at a pre-determined frequency and amplitude sufficient to create cavitation to prevent buildup of tissue and debris, and means for energizing the blade for cutting and coagulating, said improvements to the blade comprising of:

(a) a blank having two opposed side surfaces and a working edge along a pre-determined portion thereof, said blank having a notch cooperating with said means associated with said handle member for retaining said blade, said blank being made of a material having a conductive surface;

(b) a first insulative coating covering all of said blank except said working edge of said blank and a portion of the conductive surface of said blank which comes in contact with said electrical-to-mechanical transducer means;

(c) a first electrically conductive strip member disposed on said first insulative coating and having one end thereof leading to said portion of the conductive surface of said blank which comes in contact with said electrical-to-mechanical transducer means;

(d) a second electrically conductive strip member disposed on said first insulative coating on one side surface of said blank so as to be electrically insulated from the conductive surface of said blank, said second conductive strip member having a portion located near the working edge of said blank;

(e) a third electrically conductive strip member disposed on said first insulative coating on the side surface of said blank opposite said one side surface so as to be electrically insulated from the conductive surface of said blank, said third conductive strip member having a portion located near the working edge of said blank and generally parallel to said portion of said second conductive strip member; and

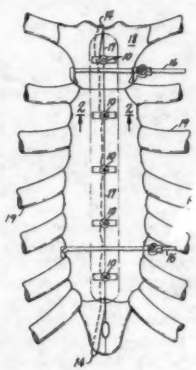
(f) a second insulative coating deposited upon a predetermined portion of said blank for preventing passage of body fluids into said handle member during use.

4,802,477

STERNUM CLOSURE DEVICE

Shlomo Gabbay, 1 Randall Dr., Short Hills, N.J. 07078

Filed May 7, 1987, Ser. No. 47,869
Int. Cl.[4] A61B *17/08, 17/14*
U.S. Cl. 128—317 32 Claims



22. A method of treating a sternum after opening, said sternum having an upper side and a lower side, said method comprising closing said sternum, anchoring a plurality of fastening means to said sternum spaced apart along an incision, whereby lower sections of at least some of said fastening means extend beneath said sternum and said fastening means also have upper sections extending on said upper side of said sternum, placing a flexible saw beneath said sternum, between said lower sec-

tions and said lower side of said sternum, and substantially along said incision.

4,802,478

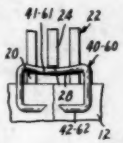
MEDICAL STAPLE AND REMOVAL METHOD

August L. Powell, Livonia Township, Sherburne County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 354,764, Mar. 4, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 647,256

Int. Cl.[4] A61B *17/04*

U.S. Cl. 128—334 R **5 Claims**



1. In a method for inserting and removing staples with respect to living tissue or skin, comprising the steps of:

providing an open staple comprising a central portion, and end portions attached to said central portion and having pointed distal ends which project away from its central portion in a single plane;

positioning the pointed ends of the staple adjacent the tissue;

closing the staple by bending it in the plane so that its pointed ends pierce the tissue and its end portions move to a position with their pointed ends adjacent each other so that the tissue is gathered and held together by the closed staple; and

opening the staple by bending the central portion of the staple to generally a U-shape so that the end portions of the staple will retract from the tissue, which bending is caused by placing two spaced jaw members of a staple remover between the tissue and the central portion of the staple, placing a third jaw member of the staple remover between said two jaw members on the side of said central portion opposite said tissue, and manually manipulating the staple remover to move the jaw members into general alignment with each other so that the U-shaped bend is made in the central portion;

the improvement wherein said method further includes providing a crank-like structure along the central portion of the staple, which crank-like structure is adapted to receive the jaw members, and in response to pressure from the jaw member as the jaw members are initially pressed against the central portion of the staple, will first orient the staple at a predetermined position with respect to the jaw members, and will then maintain that orientation as the central portion is bent to generally a U-shape by subsequent movement of the jaw members.

4,802,479

HAND-HELD INSTRUMENT FOR IMPLANTING, DISPENSING, AND INFLATING AN INFLATABLE MEMBRANE

Terry M. Haber, Lake Forest, and William H. Smedley, Lake Elsinore, both of Calif., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Oct. 31, 1986, Ser. No. 925,163

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

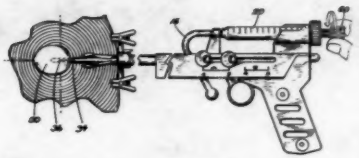
Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—344 **20 Claims**

1. An instrument for implanting an inflatable genitourinary prosthesis within the urethral tissues of a patient to increase local tissue density and the application of occlusive pressure at the periurethral tissues of the corpus spongiousum for treating urinary incontinence, said instrument including an inflatable genitourinary prosthesis, means for inflating said prosthesis with material, and trocar assembly means comprising:

an infusion tube extending between said inflating means and said prosthesis to deliver material for inflating said prosthesis;

a pair of normally open tunneling members for dilating a tunnel through the urethral tissues, said tunneling members movable to either a closed position to surround and



protect an uninflated prosthesis and thereby form a tissue dilating nose or to an open position to permit said prosthesis to be inflated and positioned within the urethral tissues; and

an outer trocar sleeve movable to a first position to surround and engage said tunneling members to retain said members in the closed position to form said dilating nose or to a second position retracted from said tunneling members to release said members for movement to the open position to permit inflation of said prosthesis.

4,802,480

METHOD FOR TREATING PORTIONS OF THE HUMAN BODY

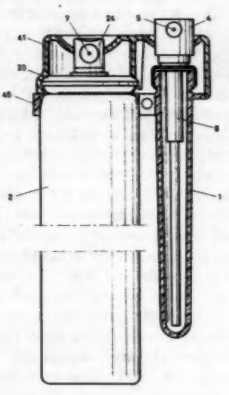
Karl Mäder, Pfäffikon; Guido Schönenberger, Reinach, and Carlo A. Buzzi, Zürich, all of Switzerland, assignors to I D C - Chemie AG, Freienbach, Switzerland

Continuation of Ser. No. 856,990, Apr. 29, 1986, Pat. No. 4,711,375. This application Aug. 20, 1987, Ser. No. 87,321

Claims priority, application Switzerland, May 17, 1985, 2123/85

Int. Cl.[4] A61F *7/00*

U.S. Cl. 128—400 **3 Claims**



1. A method of treating burn and scald wounds and localized disorders on portions of the human body by rapid cooling thereof comprising the steps of:

(a) spraying a liquid from a first hand held container;

(b) directing the sprayed liquid at the human body portion to be treated to form thereon a film of said liquid; and

(c) spraying and directing onto said film of liquid from a second hand held container a refrigerant at a temperature low enough and at a flow rate high enough to freeze a substantial portion of said film of liquid, whereby said human body portion is rapidly cooled by heat absorbed by the frozen film, and wherein the steps of spraying a liquid from a first hand held container and of spraying a refrigerant from a second hand held container are performed with said first and second containers provided in a single hand held device.

4,802,481

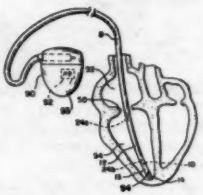
APPARATUS FOR CONTROLLING PACING OF A HEART IN RESPONSE TO CHANGES IN STROKE VOLUME

Edward A. Schroeppel, Miramar, Fla., assignor to Cordis Leads, Inc., Miami, Fla.

Division of Ser. No. 885,063, Jul. 14, 1986, Pat. No. 4,708,143, which is a division of Ser. No. 632,625, Jul. 19, 1984, Pat. No. 4,600,017. This application Sep. 17, 1987, Ser. No. 97,817

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **3 Claims**



1. An apparatus for sensing pressure changes in a heart chamber to determine opening and closing of a tricuspid valve in a heart, for using those determinations of openings and closings of the tricuspid valve to determine stroke volume and changes in stroke volume, and for controlling pacing of a heart relative to changes in stroke volume, said apparatus comprising: a pacer having therein pulse generating circuitry for generating pacing pulses, control circuitry for controlling the pulse generating circuitry and a socket; a pacing lead having a proximal termination received in said pacer socket, being electrically coupled to said pacer in said socket and having a lead body; a pressure sensor mounted in said lead body; a pacing electrode on said lead body; means for establishing a pacing circuit including said pacing electrode, said pulse generating circuitry and said control circuitry; said control circuitry including circuit means in said pacer coupled to said sensor for sensing changes in pressure in a heart chamber to determine the opening of a tricuspid valve during each heart cycle and the closing of the tricuspid valve during each heart cycle; means for calculating ejection time from the openings and closings of the tricuspid valve; means for calculating the changes in ejection time, ΔET, from calculations of ejection time; means for calculating changes in stroke volume, ΔSV from calculations of ejection time; means for determining the required change in heart rate, ΔR, relative to the changes in stroke volume, ΔSV; and means in said control circuitry for adjusting the pacing rate of said pacer relative to the required change in heart rate, ΔR.

4,802,482

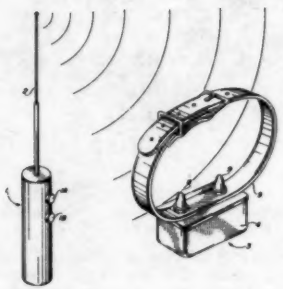
METHOD AND APPARATUS FOR REMOTE CONTROL OF ANIMAL TRAINING STIMULUS

Gerald J. Gonda, and Gregory J. Farkas, both of Tucson, Ariz., assignors to Tri-Tronics, Inc., Tucson, Ariz.

Filed Sep. 21, 1987, Ser. No. 99,410

Int. Cl.[4] A61N *1/00*

U.S. Cl. 119—29 **12 Claims**



1. A training apparatus comprising in combination:

(a) a transmitter including means for selectively producing and terminating first and second rf control signals and means for transmitting the first and second rf control signals;

(b) a receiver-stimulator unit remote from the transmitter, the receiver-stimulator unit including a harness or collar and first and second electrodes that extend from the harness or collar through fur to skin of an animal to apply electrical stimulation thereto;

(c) first circuit means in the receiver-stimulator unit for beginning and terminating first and second stimulation control signals in immediate response to beginning and terminating of the first and second rf control signals, respectively;

(d) second circuit means for (1) beginning and terminating a first signal burst including a first number of current pulses per second in response to the first stimulation control signal, and (2) beginning and terminating a second signal burst including a second number of current pulses per second in response to the second stimulation control signal, the second number being substantially greater than the first number; and

(e) a transformer having a primary winding coupled to the second circuit means to conduct the current pulses, and a secondary winding, the secondary winding having first and second terminals coupled to first and second electrodes, respectively, the primary winding, secondary winding, and the second circuit means co-acting to cause a sufficiently high open circuit voltage difference between the first and second electrodes for current pulses of either of the first and second signal bursts to produce electrical arcs that jump across a gap between the skin of the animal and the first and second electrodes, respectively, to apply electrical stimulation to the animal despite the presence of the gap in response to either of the first and second stimulation control signals.

4,802,483

HEART PACEMAKER FOR AVOIDING PACEMAKER MEDIATED TACHYCARDIA AT MODE SWITCHING

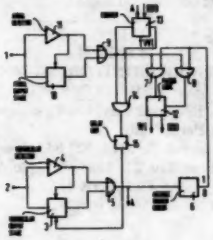
Anders Lindgren, Taeby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 5, 1987, Ser. No. 22,006

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1986, 3609072

Int. Cl.[4] A61N *1/00*; H05G *00/00*

U.S. Cl. 128—419 PG **20 Claims**



1. A heart pacemaker comprising:

means for stimulating the atrium and sensing atrial events;

means for stimulating the ventricle and sensing ventricular events;

switching means connected to said means for stimulating the atrium and to said means for stimulating the ventricle for switching between selected stimulation modes, including an atrial synchronous mode, upon the occurrence of a predetermined heart condition; and

delay means connected to said switching means for delaying switching to said atrial synchronous mode until after a selected delay following sensing of the predetermined heart condition which caused the switching to said atrial synchronous mode.

4,802,484

METHOD AND APPARATUS TO MONITOR ASYMMETRIC AND INTERHEMISPHERIC BRAIN FUNCTIONS

Ernest H. Friedman, 1831 Forest Hills Blvd., East Cleveland, Ohio 44112; Gary G. Sanders, Lakewood, Ohio, and Steven L. Hunter, Livermore, Calif., assignors to Ernest H. Friedman, Cleveland, Ohio

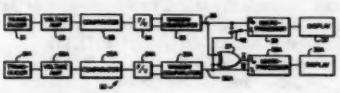
PCT No. PCT US85/01909, § 371 Date May 22, 1987, § 102(e) Date May 22, 1987, PCT Pub. No. WO87/01922 PCT Pub. Date Apr. 9, 1987

Continuation-in-part of Ser. No. 503,821, Jun. 13, 1983, Pat. No. 4,543,957. PCT filed May 22, 1987, Ser. No. 77,550

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—630 **13 Claims**



1. A human response system for determining the rate of hiatuses between neuromotor responses of a human subject, comprising in combination:

transducer means responsive to at least one type of monitored neuromotor response of the subject who is subjected to sensory inputs to the right and left hemispheres of the brain;

hiatus means connected to said transducer means to determine successive occurrences of a hiatus between predetermined neuromotor responses of said at least one type of the subject, with each hiatus defined as the absence of said at least one type of monitored neuromotor responses for a predetermined time interval bounded by the predetermined neuromotor responses;

rate means connected to said hiatus means to determine the average hiatus rate in a given segment of the predetermined neuromotor response of the subject;

sorting means to sort the average hiatus rate into one of at least two levels of response;

and means to indicate the average time duration of the individual hiatuses for each of the at least two rate levels.

4,802,485

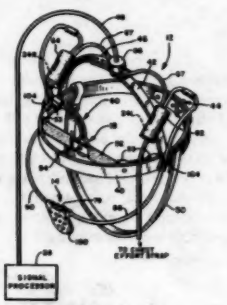
SLEEP APNEA MONITOR

David L. Bowers, La Mesa, and Gunther W. Kienle, El Cajon, both of Calif., assignors to Sentel Technologies, Inc., Waukesha, Wis.

Filed Sep. 2, 1987, Ser. No. 92,055

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—633 **17 Claims**



1. A sensor positioning device for an oximeter of the type comprising an emitter having at least one light source, a receiver having at least one photosensor, and means for monitoring the receiver to measure selected body parameters, said device comprising:

a headband configured to rest on the head of a subject;

means for mounting the emitter and the receiver to the headband in side-by-side relationship such that both the emitter and the receiver are directed toward the forehead of the subject;

means, included in the mounting means, for resiliently biasing the emitter and receiver into contact with the forehead of the subject;

a breath sensor; and

means for mounting the breath sensor to the headband to position the breath sensor to respond to air exhaled by the subject.

4,802,486

METHOD AND APPARATUS FOR DETECTING OPTICAL PULSES

David E. Goodman, San Francisco, and James E. Corenman, Menlo Park, both of Calif., assignors to Nellcor Incorporated, Hayward, Calif.

Continuation of Ser. No. 718,525, Apr. 1, 1985. This application Jun. 7, 1985, Ser. No. 742,720

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—633 **28 Claims**

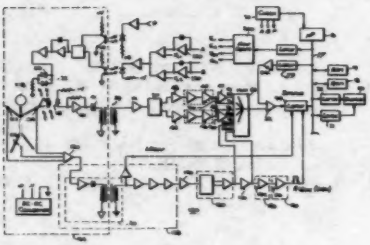
1. An improved method for photoelectrically detecting arterial pulses of a patient comprising:

detecting the blood flow, which may include arterial pulses and artifacts, at the patient's body tissue using a device

that calculates blood constituents from the detected blood flow;

detecting the occurrence of a selected portion of the patient's EKG waveform as the occurrence of the heartbeat of the patient;

correlating the occurrence of the heartbeat with the detection of pulses by the blood constituent calculating device by determining a period of time in which an arterial pulse is likely to be detected after the occurrence of a selected portion of the EKG waveform; and



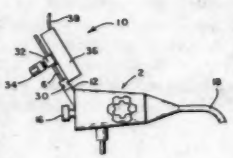
determining whether or not a detected pulse is likely to be a detected arterial pulse by determining that a detected pulse is one of either a first pulse acceptable for processing as an arterial pulse when the pulse is detected in the determined period of time after the selected portion of the EKG waveform occurs, or a second pulse not acceptable for processing as an arterial pulse when it is detected other than in the determined period of time after the selected portion of the EKG waveform occurs.

4,802,487

ENDOSCOPICALLY DELIVERABLE ULTRASOUND IMAGING SYSTEM

Roy W. Martin, Redmond, and Fred E. Silverstein, Seattle, both of Wash., assignors to Washington Research Foundation, Seattle, Wash.

Filed Mar. 26, 1987, Ser. No. 30,898
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—662.06 **44 Claims**



1. A system for ultrasonically imaging internal tissues through the biopsy channel of an endoscope, comprising:

a catheter having a diameter that is sufficiently small to pass through said biopsy channel;

an ultrasound probe mounted at one end of said catheter, said ultrasound probe having a maximum transverse dimension that is sufficiently small to pass through said biopsy channel, said ultrasound probe having a transversely directed beam pattern;

position measuring means coupled to said catheter and adapted to be coupled to said endoscope for generating an ultrasound probe position signal indicative of the longitudinal position of said catheter with respect of said endoscope;

latch means actuatable to manually disengage said catheter from said position measuring means so that said catheter can move longitudinally without varying said ultrasound probe position signal; and

imaging means connected to said ultrasound probe by conductors extending through said catheter, said imaging means generating an ultrasound signal that is applied to said probe to generate an acoustic signal, said imaging means further receiving an ultrasound signal from said ultrasound probe corresponding to ultrasound acoustic signals reflected from said tissues to said ultrasound probe, said ultrasound imaging means generating said ultrasound image from said received ultrasound signal and from said ultrasound probe position signal.

4,802,488

BLOOD PRESSURE MONITORING METHOD AND APPARATUS

Joseph S. Eckerle, Redwood City, Calif., assignor to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 927,843, Nov. 6, 1986. This application Jan. 27, 1987, Ser. No. 7,038
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—672 **15 Claims**

1. A system for the continuous external measurement of blood pressure in an underlying artery of a subject including an array of individual pressure sensitive elements, the length of which array exceeds the diameter of the underlying artery,

means employing outputs from all elements of the array for identifying one element at a center of a region to be searched,

user information input means for entering information concerning the subject related to the diameter of the underlying artery into the system,

means employing said information concerning the subject related to the diameter of the underlying artery for estimating an extent of said region to be searched, and

means responsive to outputs from only those elements within said region for selecting one element having a local minimum of at least one of the diastolic and systolic pressures on a plot of diastolic or systolic pressure versus transducer element number.

4,802,489

METHOD FOR CARRYING OUT BLOOD FLOW MEASUREMENTS AND A PROBE THEREFOR

Meir Nitzan, Mizrach Binyamin, Israel, assignor to Jerusalem College of Technology, Jerusalem, Israel

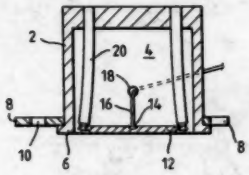
Filed Jul. 23, 1987, Ser. No. 76,785
Claims priority, application Israel, Jul. 29, 1986, 79541
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—691 **12 Claims**

1. A probe for regional blood flow measurement, comprising:

a housing of low thermal conduction and heat capacity, at least one face of which is adapted to make contact with a tissue region investigated, said face being provided with a recessed portion;

a single relatively thin plate made of a material of high thermal conductivity, located in said recessed portion and being substantially flush with said tissue-contacting face of said housing;

a temperature-sensing means in thermal contact with said plate and adapted to transfer temperature-related information to the outside of said housing,



wherein the respective configurations of said plate and said housing are such as to minimize the area of contact between them relative to the area of contact between said plate and said tissue region, in order to minimize heat flow between said plate and said housing.

4,802,490

CATHETER FOR PERFORMING VOLUMETRIC FLOW RATE DETERMINATION IN INTRAVASCULAR CONDUITS

G. Gilbert Johnston, 28511 - 10th Ave. South, Federal Way, Wash. 98003

Continuation-in-part of Ser. No. 667,333, Nov. 11, 1984, Pat. No. 4,637,401. This application Jan. 20, 1987, Ser. No. 5,007
The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—661.08 **16 Claims**

1. A catheter for use within an intravascular conduit, said catheter comprising:

an elongated tube having a proximal portion of substantially flexible material and having a distal portion;

flow restriction means carried by said distal portion of said tube, said flow restriction means being selectively controllable between a first state in which said flow restriction means does not substantially restrict flow through a reference plane transverse to the longitudinal axis of such distal portion when said catheter is in use in a location substantially fixed with respect to said reference plane and a second state in which said flow restriction means does substantially restrict flow through said reference plane when said catheter is in said location; and

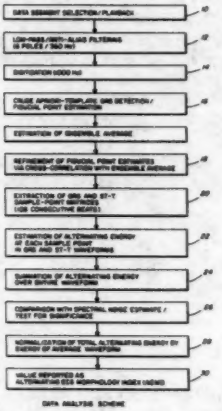
ultrasonic transducer means carried by said distal portion proximate said flow restriction means, said ultrasonic transducer means having a ring-shaped construction arranged so as to transmit and receive ultrasonic energy along a beam path that intersects said reference plane at points always external to said flow restriction means.

4,802,491

METHOD AND APPARATUS FOR ASSESSING MYOCARDIAL ELECTRICAL STABILITY

Richard J. Cohen, Newton Highlands, and Joseph M. Smith, Brookline, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 30, 1986, Ser. No. 891,653
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—702 **17 Claims**



1. Method for analyzing cycle-to-cycle variability in a physiologic waveform for assessing relative physiologic stability, comprising:

digitizing the waveform at a plurality of sample points for each cycle;

constructing two-dimensional sample point matrices, having rows and columns, from the digitized waveform; and

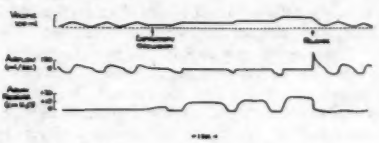
analyzing variability in each column of the sample point matrices to form an index correlating with the physiologic stability.

4,802,492

METHOD FOR DETERMINING RESPIRATORY FUNCTION

Michael M. Grunstein, Denver, Colo., assignor to National Jewish Center for Immunology and Respiratory Medicine, Denver, Colo.

Filed Mar. 11, 1987, Ser. No. 24,684
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—720 **10 Claims**



1. A method for measuring respiratory function in a subject comprising:

(a) covering nose and mouth of said subject with a sealable face mask, said face mask equipped with means connected to a flowmeter, a two way valve with a first port delivering air for inhalation and a second port for removing exhaled air, and connecting means connecting said face mask to a pressure transducer;

(b) permitting spontaneous breathing by said subject through said first port for a predetermined number of

breaths while occluding exhalation of air inhaled by said patient through said first port;

(c) measuring progressive cumulation of inspired volume in the lungs of said subject with said flowmeter and increases in mask pressure with said pressure transducer;

(d) relating said volume cumulation measured with said flowmeter and mask pressure increases measured with said pressure transducer to determine the subject's respiratory compliance;

(e) spontaneously releasing said exhalation occlusion;

(f) measuring flow of exhaled air through said second port following release of said occlusion with said flowmeter;

(g) measuring volume change in said subject's lungs following release of said occlusion;

(h) relating said measured flow and said volume change to determine the time constant of said subject's respiratory system; and,

(i) relating the time constant and said respiratory compliance to determine respiratory system resistance in said subject.

4,802,493

DEVICE AND METHOD FOR ALLERGY TESTING

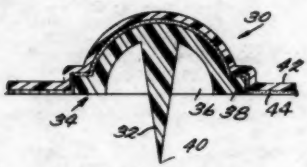
Nicholas H. Maganias, Reston Medical Bldg., 1712 Club House Rd., Reston, Va. 22090

Continuation of Ser. No. 779,612, Sep. 25, 1985, abandoned, which is a continuation of Ser. No. 445,746, Nov. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 330,587, Dec. 14, 1981, Pat. No. 4,473,083. This application Feb. 17, 1987, Ser. No. 16,487

The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—743 **19 Claims**



1. A method for allery testing comprising: applying to the skin of a patient a test strip in the form of a thin, flexible essentially transparent strip of adhesive tape a portion of which carries on its adhesive side at least one skin-penetrating projecting lance device carrying an allergen, so that the tape releasably adheres to the skin, the lance device including a plate-like substrate having in one surface thereof an imperforate concave surface forming an open-ended cavity retaining liquid allergen therein and at least one lance projecting from said concave surface and having an outer end located outside said cavity; supplying said outer end with said allergen; and pressing at least said portion against the skin to cause the lance to penetrated the skin to a depth less than subcutaneous tissue thereby carrying a portion of the allergen into the skin and maintaining contact between the allergen and the thus-traumatized skin cells; leaving the strip in place for a period of time sufficient for the patient's skin, if allergic to the allergen, to produce an allergic reaction which can be observed through the strip.

4,802,494

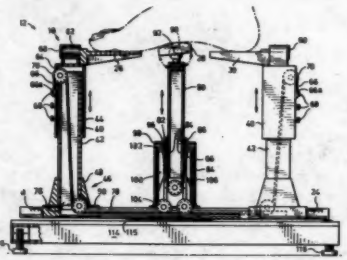
MEASUREMENT OF THE NEUTRAL ALIGNMENT POSITION OF THE FOOT

Roy J. W. Gardiner, Toronto, Canada, assignor to Sports Bio-Mechanics Research Inc., Toronto, Canada

Filed Oct. 2, 1986, Ser. No. 914,270

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—779 **18 Claims**



1. An apparatus for establishing the neutral alignment position of a foot, comprising:

a toe portion support means,

a heel portion support means and an arch portion support means disposed between said toe portion support means and said heel portion support means,

connecting means for connecting said toe, heel, and arch portion support means together,

each of said support means being alignable with the corresponding portions of said foot and mounted for relative movement parallel to a vertical axis and about a longitudinal axis in response to forces exerted thereon by said corresponding portions, and

indicating means for indicating the orientation of each of said toe portion support means, said arch portion support means and said heel portion support means.

4,802,495

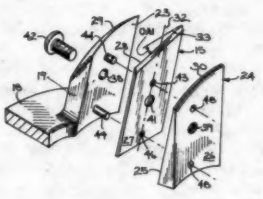
METHOD AND APPARATUS FOR RENEWING CUTTING EDGES IN CORN PROCESSING EQUIPMENT

Gerald F. Maruska, 329 Cheyenne Trail, Madison, Wis. 53705

Filed May 13, 1985, Ser. No. 733,989

Int. Cl.[4] A01F *11/06*

U.S. Cl. 130—9 B **15 Claims**



1. A method of renewing a cutting edge of a knife of a type used in a machine for cutting corn kernels from a corn cob, the method comprising:

providing a knife blade having a substantially planar body which is formed along a blade axis to be disposed longitudinally with respect to an ear of corn moving longitudinally through the machine and which is flexible in a direction transverse to the axis, the knife blade also having at a forward end of the body an oblique cutting edge that is disposed at an oblique angle relative to the transverse

direction of the body and the knife blade having a rear end;

positioning the knife blade in a knife blade holder with the blade axis of the body elevated at the rear end of the body to form an acute angle with a longitudinal axis of an ear of corn moving longitudinally through the machine; and

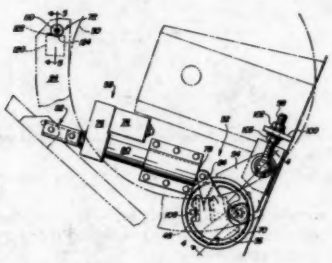
flexing the body transverse to its blade axis to cause the oblique cutting edge to conform to a curved profile for cutting a spiralling swath of sufficient width along the corn cob.

4,802,496

AGRICULTURAL CONCAVE ADJUSTMENT MEANS

Robert E. Bennett, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 19, 1987, Ser. No. 51,962
Int. Cl.[4] A01F *12/28*
U.S. Cl. 130—27 S **14 Claims**



1. An agricultural combine for harvesting and threshing an agricultural crop, the combine comprising:

a supporting structure defining an internal area;

ground engaging means for supporting the supporting structure above a field;

harvesting means for harvesting a crop from a field, the harvesting means extends from the supporting structure;

threshing means for threshing the harvested crop, the threshing means having a transverse threshing cylinder and a transverse concave between which the crop is directed, the cylinder and concave are mounted in the internal space of the supporting structure and together define a relative spacing;

feeder house means mounted on the supporting structure for transporting the harvested crop from the harvesting means to the threshing means;

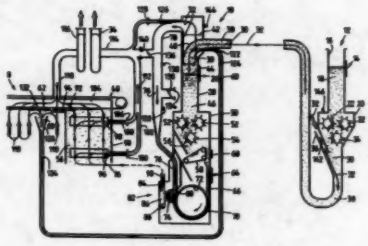
adjustment means for adjusting the relative spacing between the cylinder and concave, the adjustment means comprising two links pivotally coupled to the supporting structure outside and on opposite sides of the internal area, two camming discs each being rotatingly mounted inside one of the links outside the internal area, each of the camming discs provided with an inwardly projecting sleeves extending into the internal spaces and contacting the concave, and a transverse rod operatively coupled to both camming discs, whereby when the camming disc is rotated, the relative spacing between the concave and cylinder is adjusted by the inwardly projecting sleeves moving the concave.

4,802,497

TOBACCO FEED SYSTEM FOR CIGARETTE MAKING MACHINE

Karel Hrboticky, Etobicoke, Canada, assignor to Molins PLC, London, England

Filed Dec. 27, 1987, Ser. No. 136,938
Claims priority, application United Kingdom, Jan. 2, 1987, 8700025
Int. Cl.[4] A24C *5/14*
U.S. Cl. 131—109.1 **23 Claims**



1. A method of feeding tobacco to a cigarette machine, comprising conveying tobacco particles in an air stream from a tobacco sender device to a hopper apparatus, metering tobacco in the hopper apparatus, and pneumatically conveying it in an air stream towards an air-permeable suction band for formation, by withdrawal of the air stream, of a layer of tobacco for conveyance to a tobacco rod-forming means of the cigarette making machine, wherein atmospheric air is induced into the sender device and utilized successively for entraining and conveying the tobacco particles from the sender to the hopper apparatus, and for entraining and conveying the tobacco particles from the hopper apparatus to the suction band, the particles being disentrained from the air flow at an entrance to the hopper apparatus, and metered tobacco from the hopper apparatus being reentrained in at least part of the same air flow, the hopper apparatus being operated at a subatmospheric pressure prevailing in the air stream separated from the tobacco particles received from the sender device.

4,802,498

RESIN-BASED CHEWING TOBACCO

Warren Ogren, Rte. 8, Ogren Rd., Hayward, Wis. 54843

Filed Jul. 2, 1987, Ser. No. 69,700
Int. Cl.[4] A24B *15/18*
U.S. Cl. 131—359 **8 Claims**

1. A tobacco containing gum comprising

(a) a gum base, in a concentration of 20 to 40 parts by weight,

(b) a sweetener, in a concentration of 5 to 25 parts by weight,

(c) a softener, in a concentration of 0.1 to 3 parts by weight.

(d) a filler, in a concentration of 0.1 to 5 parts by weight,

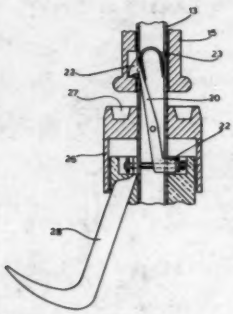
(e) sorbitol in a concentration of 40 to 70 parts by weight,

(f) tobacco, in a concentration of 0.1 to 20 parts by weight,

(g) propolis, in a concentration of 0.1 to 5 parts by weight, and

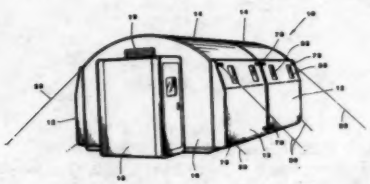
(h) a natural flavoring, in a concentration of 0.1 to 3 parts by weight.

4,802,499
UMBRELLA WITH PISTOL-SHAPED HANDLE AND TRIGGER-ACTIVATED OPENING DEVICE
Dennis Lisack, 3710 Trailridge, Louisville, Ky. 40222
Filed Jul. 27, 1987, Ser. No. 78,297
Int. Cl.[4] A45B *25/14*
U.S. Cl. 135—24 **4 Claims**



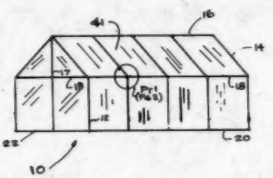
1. An umbrella with a pistol-shaped handle comprising:
a. a self-opening umbrella frame attached to a tubular shaft;
b. a pawl containing a first opening means secured to the tubular shaft adapted to open the umbrella when the first opening means is depressed;
c. a pistol-shaped handle secured to the tubular shaft; and
d. a trigger-activating second opening means comprised of a pivot lever pivotally secured to the pistol handle and a trigger linkage comprised of an upper plate located above the tubular shaft, a lower plate located below the tubular shaft and a pair of pins which connect the upper plate to the lower plate, wherein said second opening means is contained in the pistol-shaped handle.

4,802,500
PORTABLE COLLAPSIBLE BUILDING SYSTEM OF MODULAR CONSTRUCTION
James P. Davis, and David W. Henry, both of c/o Miles Yanick & Co., 261 Madison Ave. S., Bainbridge Island, Wash. 98110
Filed Aug. 14, 1987, Ser. No. 85,466
Int. Cl.[4] E04H *15/14, 15/48, 15/02*
U.S. Cl. 135—97 **8 Claims**



1. A collapsible, self-storing, portable building system, comprising:
(a) substantially identical, collapsible modular floor and sidewall units for use in pairs, each of said modular units being generally rectangular and including a generally flat, planar and rigid floor section and a rigid sidewall section, said floor section and said sidewall section being hingedly attached to each other along adjacent edges and allowing said sidewall section to be pivotally rotated from a closed position in which the perimeters of said floor and sidewall sections are generally coincident and engageable with each other, to an open and upright position relative to its related floor section, said sidewall section having inwardly extending edge walls around its periphery such that an inside surface is formed to define a storage cavity between said floor and sidewall sections when their respective peripheries are engaged, said pairs of modular floor and sidewall sections in their open and upright position being detachably connected to each other along their abutting edges for holding said pairs securely together,
(b) removably attachable and collapsing roof members adapted to be secured to and between the tops of said pairs of sidewall sections and to be stored in said storage cavity, and
(c) collapsible and attachable end wall sections adapted to be secured to the ends of said modular units and including door means.

4,802,501
PORTABLE SHELTER
James W. Hall, II, 517 Carroldale SE., Canton, Ohio 44707
Filed Jul. 21, 1987, Ser. No. 76,056
Int. Cl.[4] E04H *15/48*
U.S. Cl. 135—109 **28 Claims**

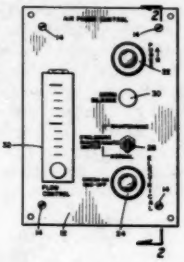


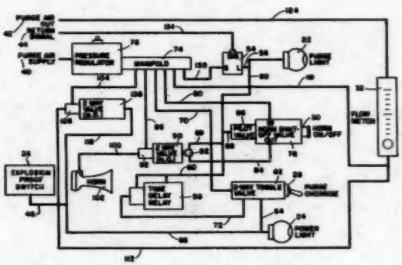
1. A prefabricated, collapsible, portable shelter frame comprising
(a.) a bottom side member for supporting the bottom of said frame
(b.) an upright vertical member for supporting the side of said frame, having a first end anchored directly or indirectly to the ground
(c.) a horizontal side member attached to a second end of said vertical member and tying two vertical members together
(d.) a roof support member having a first end attached to said second end of said vertical member and forming an obtuse angle with said vertical member for supporting a roof
(e.) an apex member attached to a second end of said roof support member and tying two roof support members together on one side of the roof wherein said vertical member, horizontal side member, roof support member and apex members are attached to each other by swivel means wherein said swivel means between said vertical member and said horizontal side member and between said roof support member and said apex member comprises a hinge and sleeve member which provides for 360 degree rotation of said horizontal side member and said apex member with respect to said vertical member and said roof support member respectively and wherein said swivel means comprises an axel and a wheel or angular rotation between said members, and wherein said axel is attached to a rotatable sleeve for positional rotation between said members.

4,802,502
PURGE AIR CONTROL SYSTEM
Henry L. Williams, Oklahoma City, Okla., assignor to Geolograph Pioneer, Inc., Oklahoma City, Okla.
Filed Feb. 20, 1987, Ser. No. 16,854
Int. Cl.[4] B65D *25/00*
U.S. Cl. 137—382 **5 Claims**

1. A purge control system for providing and maintaining a non-hazardous environment within an electronics enclosure

comprising a separate purge air box housing non-electrical components, an outlet port on the box for supplying inert gas under pressure from a purge air supply to the electronics enclosure and an inlet port on the box for receiving inert gas under pressure back from the electronics enclosure; a manifold mounted in the box; a pressure regulator mounted in the box and in fluid communication with a purge air supply for providing the purge air to the manifold; a flow meter mounted on the box for providing a flow of purge air from the manifold to the electronics enclosure through the outlet port and for determining the rate of flow to the outlet port; a signal valve having one inlet in communication with the manifold and another inlet in communication with the inlet port; the signal valve having an





outlet providing a pneumatic signal when pressure is received at the inlet port; a first pneumatic light mounted on the box connected to the outlet of the signal valve for indicating the status of purge air pressure coming from the enclosure; a time-delay pneumatic relay connected to the outlet of the signal valve for providing a delayed signal in response to the signal received by the signal valve; an explosion-proof, pneumatically operated switch connected to the output of the time-delay relay for providing electrical power to the electronics enclosure in response to the delayed signal; and a second pneumatic light mounted on the box and responsive to the delayed signal for indicating the status of electrical power going into the enclosure through the explosion-proof switch.

4,802,503

CONTROL VALVE FOR FLUSHING SYSTEM

Guang-Yue Sheen, No. 1-2, Lane 23, Yeong Chang Third St., Taichung, Taiwan

Filed Jul. 8, 1988, Ser. No. 216,290
Int. Cl.[4] F16K *31/26*
U.S. Cl. 137—413 **1 Claim**

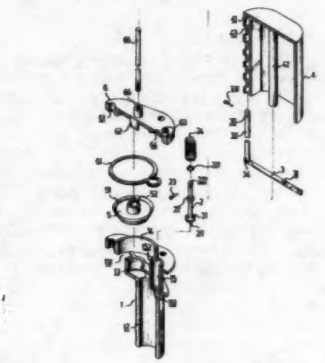
1. A flushing system control valve comprising the combination of:

(a) a main body (1) having an inlet channel (12), an outlet port (13), a valve chamber (14), and a control study cavity (15); an upper portion of said inlet channel (12) communicating with said outlet port (13); an upper end of said outlet port (13) opening into said valve chamber (14); said inlet channel (12) also communicating with said control stud cavity (15) via a stop hole (151) situated therebetween;

(b) a control rod (2) having a notched stopper (21) on a lower end thereof and a seal on a lowermost end thereof; said control rod (2) being movable in said control stud cavity (15) through a two-way flow channel (64); a plug (22) being positioned roughly mid-way up said control rod (2); a spring (24) encompassing said control rod (2), said spring (24) being retained on a lower end thereof by said notched stopper (21);

(c) a stop valve (5) having a substantially stepped disk shape with a cylindrical sleeve (52) on an upper side thereof and a pliable valve cover (51) fitting on a lower side thereof for providing water-tight engagement with said valve chamber (14);

(d) a lid (6) comprising a fixing element (66), a protrusion (62), said two-way flow channel (64), and a gasket (61); said gasket (61) being located on an uppermost end of said main body (1); said lid (6) fitting tightly on an upper portion of said main body (1); a guide rod (65) being threadably fixed at a lower end thereof in said fixing element (66); said sleeve (52) being vertically slidable on said protrusion (62);



(e) a support rod (3); a lug (63) being disposed on said lid (6) one end of said support rod (3) being pivotally connected at said lug (63) and a second end of said support rod (3) being pivotally connected to a shaft (32); said shaft (32) having a hole (33) at an upper end thereof; a pin (331) being secured in said hole (33) and partially protruding therefrom;

(f) a float cylinder (4) having a cylindrical guide sleeve (42) therein for vertical slidability on said guide rod (65); said float cylinder (4) also having a shaft cavity (41) for housing said shaft (32); said float cylinder (4) having a plurality of adjustment notches (43) which are integrally formed in an outer part of said shaft cavity (41); said setting pin (331) of said shaft (32) being placeable on any of said plurality of adjustment notches (43) for adjusting a range of said float cylinder (4); and

said float cylinder (4) in a non-flush position being buoyed up by a full reservoir (7) of water so that said shaft (32) is elevated a corresponding distance with said float cylinder (4); said shaft (32) causing said support rod (3) to support said control rod (2) so that said plug (22) of said control rod (2) closes said passage (152) when float cylinder (4) is in a non-flush position; and

said float cylinder (4) in a flush position resting on said fixing element (66) so that said shaft (32) is in a lowermost posi-

tion thereby causing said support rod (3) and said control rod (2) to be said in lowermost position; said passage (152) and said two-way flow cahnnel (64) being open when said float cylinder (4) is in a flush position so that water is urged out of an upper part of said valve chamber (14) under an upward pressure of water on a lower side of said stop valve (5), thereby allowing water to flow freely into said reservoir (7) until said float reaches said non-flush position.

4,802,504

TAP WITH FLOW LIMITER FOR GAS BOTTLES

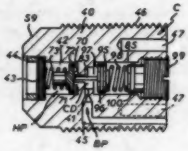
Jean-Marie Politi, Pontault-Combault, France, assignor to L'Air Liquide, Paris, France

Filed Aug. 5, 1986, Ser. No. 893,356

Claims priority, application France, Aug. 14, 1985, 85 12381

Int. Cl.[4] F16K *47/08*; F17C *13/04*

U.S. Cl. 137—454.5 **10 Claims**



1. A tap for a bottle of pressurized gas comprising a tap body having a recess therein and having means for attachment to a gas supply line, a flow limiter device in the form of a cartridge hermetically attachable within said recess, said cartridge defining a first, upstream, chamber communicating with said gas bottle attachment means a second, downstream, chamber communicating with said supply line attachment means, and an open unobstructed calibrated passage whereby said first chamber is in communication with said second chamber, the calibrated passage having a length several times its maximum transverse dimension and a predetermined constant volume, said cartridge defining a third, expansion chamber between and communicating with said first chamber and said calibrated passage, a valve within one of said chambers for controlling gas flow from said first chamber to said third chamber, calibrated control means in engagement with said valve, and spring means for biasing said valve.

4,802,505

FLUID CONTROL VALVE

Andre Gemignani, Saint Mitre les Remparts; Serge J. Boulogne, Rognac, and Gerald Schaumburg, Martigues, all of France, assignors to Societe D'Exploitation de Brevets pour L'Industrie et la Marine, Chateauneuf les Martigues, France

Filed Mar. 13, 1987, Ser. No. 25,382

Claims priority, application France, Mar. 13, 1986, 86 04120

Int. Cl.[4] G05D *16/06*

U.S. Cl. 137—492 **3 Claims**

1. A valve for controlling fluid flow between a user, a high-pressure source, and a low-pressure sump, the valve comprising:

a valve housing defining a chamber extending along an axis and formed with axially offset source, sump, and user ports respectively connected to the source, sump, and user, the user port opening into the chamber between the source and sump ports;

a valve body in the chamber having first and second coaxial but axially independently movable parts, the first part having a mainly axial throughgoing passage having one end exposed continuously to one of the source and sump ports and an opposite axially open end axially sealingly engageable with the second valve port;

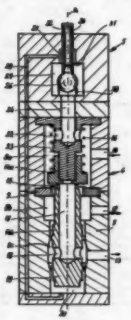
a central seat between the source and sump ports and axially sealingly engageable with one of the valve parts to isolate one of the source and sump ports from the other of the source and sump ports, the parts being displaceable between

one end position permitting flow in the chamber between the user and the other port while blocking flow between same and the one port with the valve parts in sealing engagement with each other and one of the valve parts out of engagement with the central seat while the other of the valve parts passes with clearance through the central seat,

an intermediate position blocking flow in the chamber between the ports with the valve parts in sealing engagement with each other and with the one valve part in sealing engagement with the central seat and the other valve part passing therethrough, and

a drain end position permitting flow in the chamber between the user and one port while blocking flow between same and the other port with the valve parts out of axial contact with each other and with the one valve part in sealing engagement with the central seat, the seat defining an orifice and the other valve part being engageable through the orifice with the one valve part;

a spring urging the one valve part into sealing engagement



with the seat, the housing forming with the other valve part a source compartment connectable to the source for urging the other part into axial engagement through the orifice with the one part, the valve housing further forming a pilot chamber permanently pressurized from the source and formed with a small-diameter extension;

a conduit connecting the source compartment with the small-diameter extension;

a ball in the pilot chamber sealingly engageable over the extension to separate same from the pilot chamber;

a pilot spring urging the ball into the extension;

an actuating pin engageable opposite to the pilot spring with the ball for lifting same off the extension;

the pin being tubular and having one end sealingly engageable with the ball and an opposite end connected to the sump;

a piston engageable with the pin to displace same against the ball, the housing forming an actuator chamber on one side of the piston and connected to a pressure source to be monitored; and

an actuator spring bearing opposite to the actuator chamber on the piston to urge same against the pin, whereby when the pressure in the actuator chamber exceeds the force of the actuator spring the pin pulls away from the ball to vent the extension and source compartment.

4,802,506

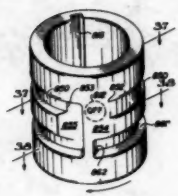
FLOW CONTROL DEVICE FOR ADMINISTRATION OF INTRAVENOUS FLUIDS

Jerry L. Asianian, 4247 E. Hazelwood, Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 630,632, Jul. 13, 1984. This application Apr. 20, 1987, Ser. No. 39,946

Int. Cl.[4] F16K *5/16, 5/10*

U.S. Cl. 137—556 **11 Claims**



1. A valve for establishing and maintaining predetermined administration flow rates in an IV system having a source of fluid connectable to an administration needle via a tubing line, said valve comprising:

(a) a housing of a first material defining a cylindrical valving chamber, said housing having an inlet and an outlet communicating with said chamber and connectable in said tubing line;

(b) a metering member having a projection rotatable within said chamber, said metering member being of a second material and extending axially within said valving chamber;

(c) a valving drum having a generally cylindrical outer surface and a predetermined axial length defining a recess engageable about said projection and defining a flow path on its outer surface, said drum being rotatable with said projection to vary the flow rate between the inlet and outlet, said drum being of a third material which is relatively softer than said first and second materials and being at least partially compressed in an assembled position in said flow chamber and being interiorly supported by said projection substantially along its entire length to provide a wiping and sealing action as the drum is rotated.

4,802,507

GAS FLOW CONTROL DEVICE

James R. Willson, Ashland, Mass., assignor to Kidde, Inc., Saddle Brook, N.J.

Filed Jan. 2, 1987, Ser. No. 46

Int. Cl.[4] F16K *31/126*

U.S. Cl. 137—613 **25 Claims**

19. A gas flow control device comprising:

a body means defining an inlet, an outlet, and a gas flow passage therebetween;

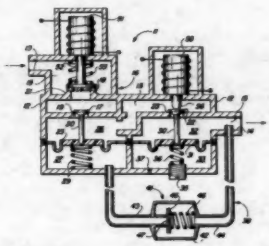
a main valve means disposed in said passage and comprising a primary valve movable between a closed position that prevents flow through said passage and an open position that permits flow therethrough;

a primary diaphragm operably connected to said primary valve and supported by said body means, said primary diaphragm defining with said body means and separating a primary reference chamber from a primary regulator chamber located in said passage, pressure in said primary reference chamber exerting a force tending to open said primary valve;

a primary bias means biasing said primary valve toward said open position;

a secondary valve disposed in said passage between said primary valve and said outlet, said secondary valve movable between a closed position that prevents flow through said passage and an open position that permits flow therethrough;

a secondary diaphragm operably connected to said secondary valve and supported by said body means, said secondary diaphragm defining with said body means and separating a secondary reference chamber from a secondary regulator chamber located in said passage, pressure in said secondary regulator chamber exerting a force tending to close said secondary valve;



a mechanical secondary bias means coupled to said secondary valve and applying thereto a mechanical force biasing said secondary valve toward said open position said secondary bias means being manually adjustable so as to permit selective variation in the mechanical force applied to said secondary valve; and

control passage means providing communication between said primary reference chamber and said outlet, said control passage means including a gas flow restriction providing restricted gas flow between said primary reference chamber and said outlet and adapted to transmit to said primary reference chamber changes in the gas pressure at said outlet after a substantial delay provided by said gas flow restriction.

4,802,508

CYCLICALLY VARYING PULSATING FLUID SUPPLY SYSTEM

George R. Styles, Glendale; K. Tom Jones, Chandler, and Devin A. Bloom, Phoenix, all of Ariz., assignors to Pacific BioSystems, Inc., Phoenix, Ariz.

Filed Mar. 31, 1988, Ser. No. 176,361

Int. Cl.[4] B08B *3/02*

U.S. Cl. 137—624.13 **21 Claims**

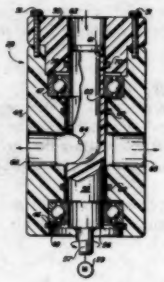
1. A system for delivering a pulsating supply of fluid to a utilization device, including in combination:

a source of fluid at a predetermined pressure;

at least first and second utilization devices for receiving fluid on first and second inlets, respectively; and

pulsator means having an inlet coupled with said source of fluid and having at least first and second outlets coupled, respectively, to said first and second inlets of said first and second utilization devices, said pulsator means apportioning fluid in a cyclically varying pattern of pressure from

the inlet thereof to each of the first and second outlets thereof such that the total fluid flow through both of said first and second outlets thereof remains substantially constant, and the pressure of fluid at the input to said pulsator



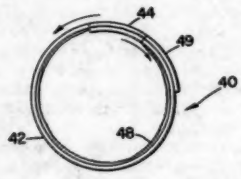
means remains substantially constant at said predetermined pressure, while the cyclical flow of fluid through said first outlet increases with a corresponding decrease of the flow of fluid through the second outlet thereof and vice-versa.

4,802,509

WRAPAROUND CLOSURE FOR CONDUIT PROTECTION

Henry E. Brandolf, 1 Quiet Ct., Miller Place, N.Y. 11764

Filed Dec. 15, 1987, Ser. No. 133,074
Int. Cl.[4] F16L *57/00*
U.S. Cl. 138—110 **5 Claims**



1. A wraparound closure for conduit protection, comprising:

(a) a substantially planar sheet of plastic material having shape memory, being heat recoverable at transition temperature T°, and having upper and lower surfaces;

(b) a mastic layer disposed on the upper surface of said sheet, said layer being composed of an adherent material selected from the group of mastic and heat-activated adhesives being activated at a temperature below T°, said adherent material being coated on the upper surface of said sheet;

(c) a first strip of self-amalgamating material partially crosslinked by exposure to a radiation dose of less than approximately 4 Mrad disposed on and integrated with said upper sheet surface where said self-amalgamating material and said adherent material are of substantially equal thickness to provide a continuous layer on said upper surface of substantially uniform thickness, said self-amalgamating material being capable of fusing together without application of heat thereto,

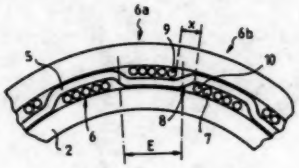
(d) a second strip of self amalgamating material partially crosslinked by exposure to a radiation dose of less than approximately 4M rad complementary to said first strip positioned on and integrated with said lower sheet surface to mate and fuse with said first strip when said sheet is wrapped around a tubular conduit and said first and second strips are juxtaposed and pressed together where application of heat to a temperature of T° causes said sheet to shrink about the conduit and the adherent material bond thereto, and the lap peel strength of the fused first and second strips is sufficient to exceed the hoop stress and lap shear imparted from the heat recovery of said plastic sheet.

4,802,510

HIGH-PRESSURE HOSE AND A PROCESS FOR ITS PRODUCTION

Yves Berlincourt, Blois, and Alain Mouchot, Cheverny, both of France, assignors to Tecalemit Flexibles S.A., Blois Cedex, France

Filed Apr. 14, 1987, Ser. No. 38,884
Claims priority, application France, Apr. 18, 1986, 8605629
Int. Cl.[4] F16L *11/10*
U.S. Cl. 138—125 **15 Claims**



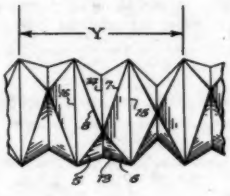
1. A flexible hose comprising an inner plastic tube covered by at least one braiding constituted of a plurality of helically crossed layers braided in two different directions around the inner plastics tube, each layer being constituted of a single flat row of filaments arranged in adjoining parallel relation, all the layers having a same number of filaments, the plurality of layers providing plural adjacent layers of filaments extending in the same direction, wherein the filaments of every layer are made of plastics, and wherein, when the hose is straight, the number of filaments per layer is such and each filaments is so deformed in its right cross-section that a gap separating two adjacent layers extending in the same direction as one another is at least 100% filled, each filament having a non-circular flattened cross-section.

4,802,511

SHIRRED TUBULAR MATERIAL

Norman G. Hensley, Lafayette, Ind., assignor to Teepak, Inc., Oak Brook, Ill.

Continuation-in-part of Ser. No. 547,817, Nov. 1, 1983, abandoned. This application Aug. 15, 1984, Ser. No. 641,136
Int. Cl.[4] F16L *11/10*
U.S. Cl. 138—118.1 **12 Claims**



1. A shirred tubular flexible material sausage casing having a central axis bore, said shirred tubular material comprising a plurality of outer folds arranged along at least two parallel and at least two counter-directional, parallel, longitudinal extend-

ing, crisscrossing helixes defining substantially diamond shaped patterns, and a plurality of inner folds arranged in a plane substantially perpendicular to the longitudinal axis of the tube, connecting opposing points of said diamond shaped patterns defined by the crisscrossing of said outer folds wherein said opposing points are rotationally displaced from the corresponding point of each preceding neighboring shaped pattern.

4,802,512

AUTOMATIC WIRE DECORTICATING AND CUTTING METHOD AND APPARATUS

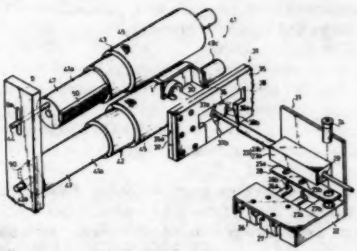
Hiroji Kodera, Gifu, Japan, assignor to Kabushiki, Kaisha, Kodera, Denshi, Seisakusho, Gifu, Japan

Filed Feb. 24, 1987, Ser. No. 18,393

Claims priority, application Japan, Feb. 25, 1986, 61-39434; Feb. 25, 1986, 61-39435

Int. Cl.[4] B21F *07/00*

U.S. Cl. 140—149 **15 Claims**



1. An automatic, covered wire cutting and decorticating method comprising the steps of:

(a) making a covered wire move by specified lengths toward one side of sending means of a cutting means disposed at a position opposed to said sending means, said wire moved by rotating a pair of rollers of said sending means,

(b) cutting a cover of said covered wire by said cutting means,

(c) pulling said covered wire to the sending means and decorticating the cover of said covered wire by rotating said rollers of said sending means, and

(d) twisting an exposed core wire by relatively moving said rollers of said sending means in the axial center direction in synchronization with said step of pulling said covered wire.

4,802,513

CLOSED SYSTEM CHEMICAL CONTAINER

Richard P. Reynolds, Greensboro, N.C., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 261,431, May 7, 1981, abandoned. This application Apr. 6, 1982, Ser. No. 364,322

Int. Cl.[4] B65D *83/00*

U.S. Cl. 141—311 R **10 Claims**

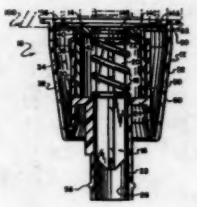
1. A container-mating closure unit for attachment to an extraction device to provide selective access to the interior of a container, comprising:

a housing adapted to be attached to a container in a fluid-tight manner, said housing defining an inner chamber and an outer chamber that is separate from and surrounds said inner chamber, said outer chamber being in fluid communication with the interior of the container;

a downtube providing fluid communication between said inner chamber and the container;

an outlet valve that is automatically opened when an extraction device is attached to the container to provide the extraction device with access to said inner chamber; and

a lid that closes the top of said housing, said lid comprising a flange that forms a flap valve which normally closes off said outer chamber from the exterior of the container and that is deformed inwardly into said outer chamber when



the extraction device is attached to the container to provide the extraction device with access to said outer chamber.

4,802,514

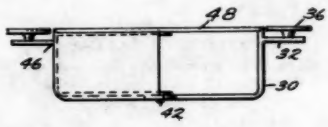
OVERFLOW SPILLAGE PREVENTER FOR FUEL TANKS IN BOATS

Chris L. Morse, 6 Coach Rd., Savannah, Ga. 31419

Filed Mar. 31, 1987, Ser. No. 32,477

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—86 **2 Claims**



1. A fuel spillage prevention device for mounting to the hull of a boat beneath a fuel tank air vent outlet, comprising:

receptacle means for collecting and storing fuel that is expelled from said outlet, said receptacle means having a flat rear wall that is adapted to contact said hull, and one or more outwardly extending projections; and

suction cup means attached to each of said projections for securing said receptacle means to said hull, said suction cup means protruding beyond said flat rear wall of said receptacle means when the apparatus is not attached to the hull of a boat whereby said receptacle may be firmly attached to the hull of a boat without damaging the hull, said device further including baffle means for intercepting fuel that is expelled from said outlet at high speeds, and means for pivotally mounting said baffle means relative to said receptacle means, whereby said baffle means may be positioned to intercept the fuel expelled from outlets on either side of a boat.

4,802,515

SAFETY GAS CYLINDER CONTAINMENT SYSTEM

Frank G. Pytryga, 972 Arundel Dr., Arnold, Md. 21012, and Martin Prince, 58 Darlington Dr., Wayne, N.J. 07470

Filed Nov. 21, 1986, Ser. No. 933,160

Int. Cl.[4] B65B *21/00*

U.S. Cl. 141—97 **14 Claims**

1. A gas containment unit comprising:

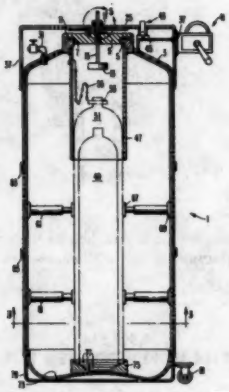
(a) a sealed storage means for receiving a container having hazardous gases or the like therein;

(b) said storage means having a bottom and a side wall;

(c) means for supporting the container in said storage means, said supporting means comprising:

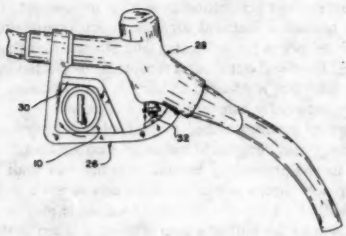
(1) at least one seat flange positioned in said bottom; and

(2) a plurality of means extending from said side wall and directed inwardly to support the gas container;
(d) means for gaining access at an end of said storage means;



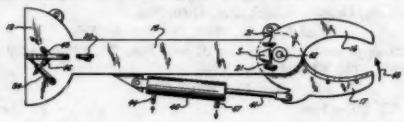
(e) a vacuum valve for removing gas from said storage means; and
(f) a gas valve for treating the gas in said storage means.

4,802,516
NOZZLE LOCK GAS CAP
David F. Dahlem, 901 Gatewood Dr., Enfield, Conn. 06082
Filed Aug. 12, 1987, Ser. No. 84,488
Int. Cl.[4] B65D *51/24*
U.S. Cl. 141—392 5 Claims



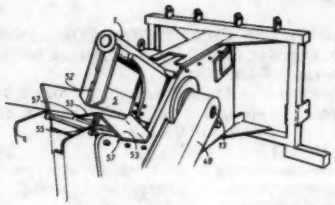
1. A gas cap, comprising:
an elliptical flange element having a first planar surface and a second planar surface and a circumferentially disposed concave-shaped recess around the periphery of said elliptical flange element between said first and second planar surfaces;
said elliptical flange element including a gas cap handle element disposed on said first planar surface, thereby providing means for applying torque to said elliptical flange element; and
a threaded curvilinear extension rigidly affixed to said second planar surface, and disposed opposingly to said gas cap handle element; whereby,
said flange element may be employed within a nozzle housing of a gasoline dispensing means having a trigger/handle, such that the elliptical flange element displaces said trigger/handle of said dispensing means in varying amounts due to the elliptical shape of the flange element, allowing thereby an adjusted flow of fuel from the dispensing means, said trigger/handle being seated in said circumferentially disposed concave-shaped recess of said flange element such that the gas cap is stabilized between the trigger/handle and said nozzle housing.

4,802,517
TREE CUTTING APPARATUS
Pat Laster, P.O. Box 31821, Lafayette, La. 70503
Filed May 9, 1988, Ser. No. 191,913
Int. Cl.[4] A01G *23/02*
U.S. Cl. 144—34 E 11 Claims



1. A cable-supported tree cutting apparatus device for use with draglines and the like comprising:
(a) an elongated tool body;
(b) a pair of opposed jaws positioned at one end of the tool body and movable with respect to one another so that the jaws can open and close;
(c) an open-ended mouth portion defined by the jaws in an open position and adapted to receive a tree to grip or cut same;
(d) a counterweight portion of the elongated body generally opposite and spaced from the open mouth;
(e) lifting eye means positioned between the jaws and the counterweight for forming a connection with a cable; and
(f) means spaced from the lifting eye means for moving the body laterally when supported by a vertically extended lift cable.

4,802,518
LOG CUTTING MACHINE
May Knight, Leek, England, assignor to David John Knight, Cheddleton, England
Filed Sep. 14, 1987, Ser. No. 96,625
Claims priority, application United Kingdom, Sep. 12, 1986, 8621986
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—193 R 16 Claims

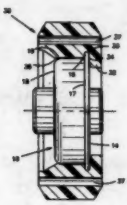


1.A log cutting machine comprising a pivotal support carrying a cutting blade, a reaction surface defined by two spaced apart oppositely inclined back-to-back ramps defining a gap therebetween, said cutting blade being movable into the gap between said ramps of said reaction surface upon pivoting of said support, a cranked drive apparatus, and connecting means movably connected to both said pivotal support and said cranked drive apparatus for effecting cyclic pivotal movement of said cutting blade toward and away from said reaction surface.

4,802,519
RUBBER TIRED ROLLER BEARING

Richard F. Moranz, Cleveland, Ohio, assignor to Kendale Industries, Valley View, Ohio

Filed Jun. 8, 1987, Ser. No. 59,573
Int. Cl.[4] B65G *13/00*; B60B *5/00*
U.S. Cl. 152—325 3 Claims

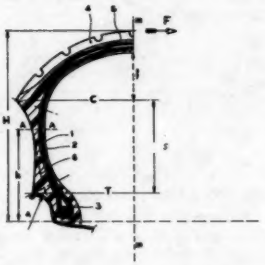


1. A wheel assembly comprising
a hub adapted to be affixed to a shaft;
an outer bearing member rotably affixed to said hub, said outer bearing member having a generally cylindrical outer perimeter wall, having a bearing flange, having a first end wall at a first end of said outer perimeter wall, and having a shoulder at a second end of said outer perimeter wall; and
a generally toroidal resilient tire, said tire having an inner perimeter wall fitting elastically around said outer perimeter wall of said outer bearing member, having a tire groove, and having a tire flange at a first end of said inner perimeter wall, said tire groove fitting elastically around said bearing flange of said outer bearing member and said tire flange overlapping said first end wall of said outer bearing member.

4,802,520
MOTORCYCLE TIRES

Giancarlo Armellin, Nova Milanese, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Italy

Filed Jun. 3, 1987, Ser. No. 56,947
Claims priority, application Italy, Jun. 9, 1986, 20716 A/86
Int. Cl.[4] B60C *3/04*
U.S. Cl. 152—454 6 Claims

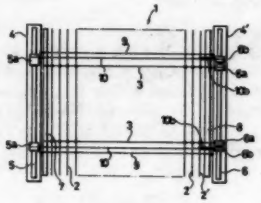


1. A tire for two-wheeled vehicle wheels having a deflection value between 0.20 and 0.40 comprising
a toridal body having a carcass of textile plies, with the sidewalls thereof having a cross-section with an arcuate curvilinear profile that is concave inwardly;
a tread band disposed in the crown zone of said carcass, sidewalls of varying thickness and beads for positioning said tire on a corresponding mounting rim;
said sidewalls, radially extending between the extremities of said tread band and the radially outermost surface of said mounting rim having in the uninflated state of the tire an axially external surface of a concave profile, wherein the radial height of said sidewalls is between 30% and 45% of the value of the total height H of said tire, the point of minimum thickness of said sidewalls being at a radial height comprised between 40% and 60% of said total height H, and the ratio between said minimum thickness and the maximum thickness of each sidewall, measured in the direction perpendicular to the profile of said carcass plies, in correspondence of the radially outermost surface of said mounting rim, being between 0.15 and 0.40, whereby in the inflated state of the tire the axially external surface of said sidewall has a substantially rectilinear profile.

4,802,521
OVERHEAD BLIND

Eiharu Tsuchida, Tochio, and Hisayoshi Nagasawa, Higashikubiki, both of Japan, assignors to Kuroe Corporation, Niigata, Japan

Division of Ser. No. 831,996, Feb. 20, 1986. This application Nov. 18, 1986, Ser. No. 932,469
Claims priority, application Japan, Nov. 25, 1985, 60-179881; Nov. 30, 1985, 60-183653
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] E06B *9/30*
U.S. Cl. 160—172 2 Claims



1. An overhead blind of the type including a plurality of slats characterized in that said plurality of slats are provided and movable in a substantially horizontal direction, said blind comprises a means for tilting said plurality of slats and a means for shifting a group of slats to open and close the blind, at least one support cable for passing through said slats and preventing said slats from drooping, said means for tilting comprising a plurality of tilt cords which supports said slats at both edges thereof in parallel to and at a substantially equal distance from each other and each of said slats for the overhead blind is formed with cutaways engageable with said tilt strings.

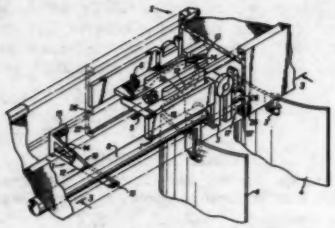
4,802,522
SUPPORT FOR AN OPERATING ELEMENT OF A VENETIAN BLIND ASSEMBLY

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Saddle River, N.J.

Continuation-in-part of Ser. No. 725,456, Apr. 22, 1985, Pat. No. 4,662,422. This application Feb. 17, 1987, Ser. No. 15,268
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.
Int. Cl.[4] E06B *9/30*
U.S. Cl. 160—168.1 6 Claims

1. A support for the operating means of a laterally movable blind assembly adapted to be moved to open and closed positions, where said blind assembly includes a plurality of vertically disposed portions each depending from a traveler supported by and movable along a longitudinal headrail extending at an angle with respect to the vertical direction, said operating

means extending parallel to said headrail and in a closed position of the blind assembly being supported at intervals along the length of said headrail by said travelers, and means for moving said travelers towards open and closed positions of said blind assembly; said support being mounted in a stationary manner in at least one location along the length of said headrail, said support having a support element normally positioned



in the path of movement of said travelers and in a supporting position with respect to said operating means, said support element being movable out of said supporting position and out of the path of movement of said travelers in response to engagement with said travelers, and means for moving said support element into said supporting position when not engaged by a traveler.

4,802,523

BLANKET SHADE FOR WINDOW FRAME

Richard A. Scholten, and Larry A. Mosteller, both of Cincinnati, Ohio, assignors to Richard A. Scholten, Cincinnati, Ohio

Filed Jul. 13, 1983, Ser. No. 513,372

Int. Cl.[4] A47H *23/00*

U.S. Cl. 160—354 **3 Claims**

1. A window and blanket shade combination comprising,

a window frame,

a stationary vertical magnetic strip on each side of said window frame,

a blanket shade attached to the top of said window frame, and covering said frame,

and a movable vertical magnetic strip disposed within said blanket shade along each edge thereof, said movable strips overlying said stationary strips when said shade is lowered,

said strips each having only three longitudinally-extending poles spaced transversely across the strip, the nominal pole spacing being three to five times the thickness of the strip,

one of said strips on each side of said frame having an N S N pole configuration, the corresponding movable strip having a S N S pole configuration, wherein each of the three poles in each of said strips is independent of the other, like poles in each strip being completely separated from each other by an unlike pole in the same strip.

4,802,524

METHOD FOR MAKING COMPOSITE MATERIAL USING OXYGEN

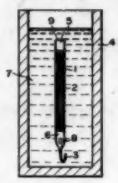
Tadashi Donomoto, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 282,185, Jul. 15, 1981, abandoned. This application Feb. 23, 1984, Ser. No. 581,226

Claims priority, application Japan, Jul. 30, 1980, 55-105654

Int. Cl.[4] B22D *19/14*

U.S. Cl. 164—97 **6 Claims**



1. A method for making a composite material, comprising the steps, performed in the specified sequence, of:

(a) charging porous reinforcing material into a tubular member having two open opposite ends;

(b) replacing substantially all of the atmospheric air occupying the space in said tubular member including the interstices of said reinforcing material by substantially pure oxygen gas by blowing oxygen gas into said tubular member from one of said open ends thereof while exhausting the air in said space from the other of said open ends thereof;

(c) closing only one of said open ends of said tubular member while substantially maintaining the conditions obtained by step (b);

(d) submerging said tubular member charged with said reinforcing material and oxygen gas into a bath of molten metal, the molten metal thereby flowing into said tubular member through said one open end thereof and filling the space in said tubular member including the interstices of said reinforcing material as the oxygen gas which has been occupying said space in said tubular member including said interstices loses its volume by reacting with the molten metal; and

(e) taking out said tubular member from said bath of molten metal and cooling it down to solidify the molten metal in said tubular member.

4,802,525

REMOVING A CASTING FROM A MOLD

Gerold Heine, Uhldingen-Muehlhofen, and Joachim Stark, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Dornier Medizintechnik GmbH, Germering, Fed. Rep. of Germany

Filed Dec. 5, 1986, Ser. No. 938,571

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543062

Int. Cl.[4] B22D *29/00*

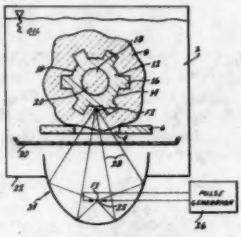
U.S. Cl. 164—48 **4 Claims**

1. Method for removing the mold or parts of the mold from a casting following solidification and cooling comprising the steps of

immersing the casting with mold or mold particles still attached in a liquid; and

generating and focusing shock waves by means of a curved

transducer onto interface portions between the mold and mold parts on one hand and the casting on the other hand,



to obtain ablation and spalling of the mold material to be removed from the casting.

4,802,526

CENTRIFUGAL CASTER

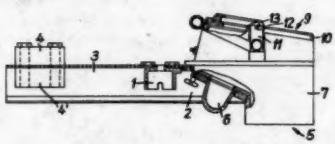
Ronald Friedrich, Kamp-Lintfort; Werner Hammecke, deceased, both of Bohmte, both of Fed. Rep. of Germany (by Marie Elise Gisela Hammecke, heiress), and Ronald Friedrich, Kamp-Lintfort, all of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 247,292, Mar. 26, 1981, Pat. No. 4,418,760. This application Jul. 22, 1983, Ser. No. 516,347

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932681

Int. Cl.[4] B22D *13/00*

U.S. Cl. 164—287 **9 Claims**



1. A centrifugal caster arrangement comprising: a motor driven centrifuge arm; a casting chamber connected to said centrifuge arm; a weight arm connected to said centrifuge arm, both said arms being rotatable about a vertical axis; a counterweight having a permanently fixed position relative to said weight arm and being immovable relative to said casting chamber and said vertical axis; a melting crucible disposed in said casting chamber; and a plurality of muffle sets, each said muffle set comprising an exchangeable muffle cage and an associated casting muffle inserted in said exchangeable muffle cage, wherein said casting chamber is provided with a region for mounting one of said muffle sets, and each said exchangeable muffle cage is matched to its associated casting muffle according to size and weight so that the total weight of each respective muffle set is of such magnitude that when each respective muffle set is mounted in said casting chamber and rotated about said vertical axis said centrifuge arm is in balance with said weight arm and said permanently fixed counterweight.

4,802,527

APPARATUS FOR CASTING MOLTEN METAL

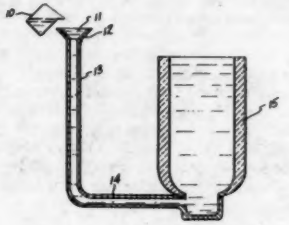
Jerry W. Brockmeyer, Hendersonville, N.C., and Michael A. Cummings, Taylor, S.C., assignors to Swiss Aluminum Ltd., Chippis, Switzerland

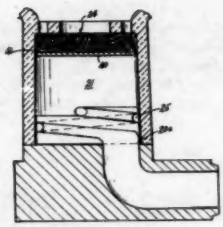
Filed Nov. 16, 1987, Ser. No. 121,634

Int. Cl.[4] B22C *9/08*

U.S. Cl. 164—358 **9 Claims**

1. An apparatus for casting molten metal which comprises: a mold for casting molten metal having a base portion; a molten metal inlet located at the base portion; a horizontally disposed filter positioned across the molten metal inlet so that all molten metal must pass therethrough; an annular holding means dis-





posed above said filter to hold said filter in place and to prevent mechanical damage to the filter; and a well beneath said inlet and beneath said filter.

4,802,528

HOOPS FOR CONTINUOUS CASTING ROLLS

Joseph J. Terrasse; Andre Boucher, both of St. Ferreol, and Michel Seux, Chambon Feugerolles, all of France, assignors to Chavanne - Ketin, Puteaux, France

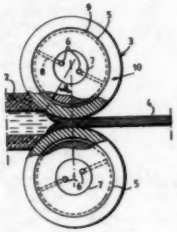
PCT No. PCT/FR86/00086, § 371 Date Nov. 14, 1986, § 102(e) Date Nov. 14, 1986, PCT Pub. No. WO86/05423, PCT Pub. Date Sep. 25, 1986

Continuation of Ser. No. 939,479, Nov. 14, 1986, abandoned. This PCT application Mar. 14, 1986, Ser. No. 191,820

Claims priority, application France, Mar. 15, 1985, 8503867

Int. Cl.[4] B22D *11/06, 11/128*

U.S. Cl. 164—428 **2 Claims**



1. In a machine for the continuous casting of aluminium alloy comprising a feed duct for molten aluminium alloy an outlet nozzle communicating with said duct and having an outlet end, and two rotatable rolls, immediately adjacent to said outlet end for receiving the molten aluminium alloy from said outlet end and rolling the aluminium alloy to a desired thickness, each of said rolls comprising in combination a core,

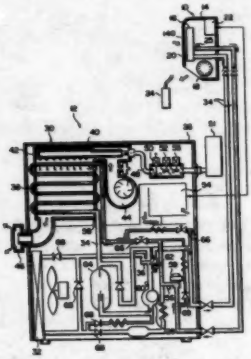
journals at each end of said core, an outer peripheral surface on said core defining peripheral grooves, cooling liquid inlet and outlet passageways in said core and in said journals for putting said grooves in communication with a cooling liquid supply, and a cylindrical outer sleeve having an inner surface mounted on said core and in close contact with said peripheral surface, said cooling liquid communicating with said inner surface through said grooves and said passageways for cooling said sleeve ; the improvement wherein said sleeve is in a forged, heat treated and machined state and consists in an alloy steel, having the following composition in percentages by weight : C: 0.30 to 0.36; Mn: 0.30 to 0.60; Si: 0.15 to 0.45; Ni: less than 0.40; Cr: 2.80 to 3.40; Mo: 0.85 to 1.25; V: 0.10 to 0.30: S: ≦0.020; P: ≦0.020; Cu: ≦0.30, the balance being substantially iron and residual impurities.

4,802,529

REFRIGERANT-HEATING TYPE HEATING APPARATUS

Shigeto Sumitani; Haruo Noguchi, both of Fuji, and Hiroyuki Araya, Fujinomiya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 14, 1988, Ser. No. 143,709
Claims priority, application Japan, May 25, 1987, 62-127702
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—29 **5 Claims**



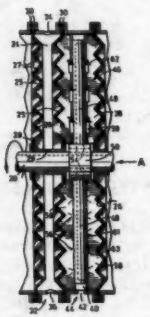
1. A refrigerant-heating type heating apparatus, comprising:
a refrigeration cycle including a compressor, an indoor heat exchanger arranged in a room, a refrigerant-heating unit for heating the refrigerant, and refrigerant tubes connecting the above components to each other, the refrigerant heating unit having a heat exchanger section through which a refrigerant flows, heating means whose combustion rate is adjustable, and guide means for guiding a combustion gas produced by the combustion of the heating means so as to heat the refrigerant flowing through the heat exchanger section;
room temperature detecting means for detecting the temperature of the room;
temperature presetting means for presetting a desired room temperature;
refrigerant temperature detecting means for detecting the temperature of a refrigerant flowing into the heat exchanger section of the refrigerant-heating means; and
control means for driving the heating means at a combustion rate according to the difference between the room temperature detected by the room temperature detecting means and the preset temperature preset by the temperature presetting means, and for shifting the combustion rate of the heating means, in accordance with the refrigerant temperature detected by the refrigerant temperature detecting means, so as to prevent the condensation of water vapor in the combustion gas flowing through the guide means when the combustion rate of the heating means is in a specified range.

4,802,530

CORRUGATED PLATE HEAT EXCHANGER

Vladimir L. Goldstein, Woodbridge, Canada, assignor to Sunwell Engineering Company Ltd., Woodbridge, Canada

Filed Aug. 13, 1987, Ser. No. 85,024
Int. Cl.[4] F25C *1/14*
U.S. Cl. 165—94 **16 Claims**



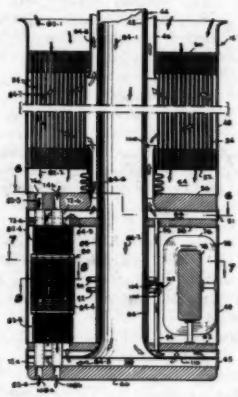
1. A blade assembly suitable for scraping a corrugated heat transfer surface of a heat exchanger, said blade assembly including at least one blade of a complementary shape to the corrugated heat exchange surface to contact said surface; and biasing means to bias said blade towards said surface to maintain the contact therebetween, said blade assembly being rotatable about an axis generally perpendicular to a plane containing said heat transfer surface.

4,802,531

PUMP/INTERMEDIATE HEAT EXCHANGER ASSEMBLY FOR A LIQUID METAL REACTOR

Richard D. Nathenson, Pittsburgh; Christopher C. Alexion, and Wayne C. Sumpman, both of N. Huntingdon, all of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 17, 1986, Ser. No. 875,151
Int. Cl.[4] H02K *44/02*
U.S. Cl. 165—104.28 **15 Claims**



1. A heat exchanger and pump assembly for transferring

thermal energy from a heated, first electrically conductive fluid to a pump second electrically conductive fluid and for transferring internal energy from said pumped second electrically conductive fluid to said first electrically conductive fluid, said assembly comprising:

(a) a heat exchanger comprising means for defining an annularly shaped cavity for receiving a flow of said second electrically conductive fluid and a plurality of tubes disposed within said cavity, each of said tubes for receiving a flow of said first electrically conductive fluid therethrough, whereby said second electrically conductive fluid in said cavity is heated;

(b) a pump assembly disposed beneath said heat exchanger and comprised of a plurality of flow couplers disposed in a circular array, each flow coupler comprised of a plurality of pump ducts for receiving said first electrically conductive fluid and a plurality of generator ducts for receiving said second electrically conductive fluid, said pluralities of generator and pump ducts disposed in a stack disposed radially with respect to said circular array;

(c) a first conduit disposed centrally of said annularly shaped cavity and within said circular array of said flow couplers for receiving said second electrically conductive fluid, said conduit extending continuously through said annular cavity and said circular array of said flow couplers;

(d) a first plenum chamber disposed beneath said pump assembly, in communication with said centrally disposed first conduit for receiving said second electrically conductive fluid and in communication with each of said generator ducts of said flow couplers for directing said pumped second electrically conductive fluid upwardly through said generator ducts in a first direction;

(e) a second plenum chamber disposed intermediate said heat exchanger and said pump assembly, in communication with each of said generator ducts for collecting said second electrically conductive fluid as discharged from each of said generator ducts and in communication with said annular cavity for directing said collected second electrically conductive fluid thereto;

(f) a third plenum chamber disposed intermediate said heat exchanger and said pump assembly and above said second plenum, in communication with said tubes for receiving said first electrically conductive fluid as discharged therefrom and in communication with said pump ducts for introducing said first electrically conductive fluid therein, whereby said first electrically conductive fluid is directed downwardly through said pump ducts in a second direction opposite to said first direction and the internal energy of said pumped second electrically conductive fluid is transferred to and pumps said first electrically conductive fluid, and

(g) a second conduit disposed concentrically about said first conduit and in communication with said second plenum chamber for directing said second electrically conductive fluid about said third plenum chamber and into said annular cavity.

4,802,532
HEAT SINK

Ronald G. Dawes, Tamworth; Geoffrey T. Hilton, Solihull; Anthony W. Marshall, and Derek Bullivant, both of Birmingham, all of England, assignors to British Telecommunications Public Limited Company, United Kingdom

Filed Jan. 23, 1987, Ser. No. 27,321

Claims priority, application United Kingdom, Jan. 24, 1986, 8601746

Int. Cl.[4] H01L *73/02*

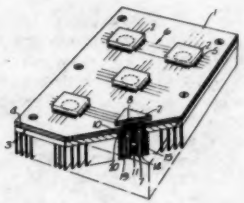
U.S. Cl. 165—80.3 **20 Claims**

1. A heat sinking apparatus for use in conducting heat away from a circuit device, said apparatus comprising:

a first heat conductive structure having an aperture therein;

a second heat conductive structure sized to fit and move axially within said aperture and including expansion means for selectively locking the second structure into a tight friction fit at a range of axial positions within the aperture; and

a third heat conductive structure having one side adapted for thermal contact with said circuit device and an opposite side adapted for thermal contact with an exposed end



of said second structure and including fastening means for selectively achieving mechanical and thermal attachment between said second and third structures while yet also permitting selective detachment of the second and third structures.

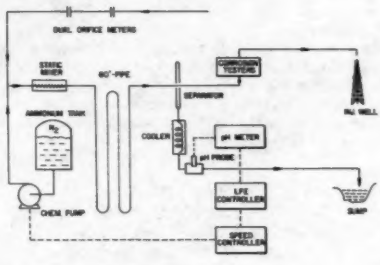
4,802,533
METHOD OF CONTROLLING PERMEABILITY DAMAGE OF HYDROCARBON FORMATIONS DURING STEAM INJECTION WHILE PREVENTING PIPE CORROSION

Liming Hsueh, Buena Park, and Marion G. Reed, Hacienda Heights, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 064,265, Jun. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 654,331, Sep. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 848,662, Apr. 4, 1986, abandoned, and a continuation-in-part of Ser. No. 909,971, Sep. 22, 1986, abandoned. This application May 24, 1988, Ser. No. 197,950

Int. Cl.[4] E21B *43/22, 47/00, 47/06*

U.S. Cl. 166—252 **25 Claims**



13. A method for inhibiting permeability damage of a hydrocarbon formation containing clay minerals in the vicinity of a well penetrating said formation, comprising:

(a) injecting a wet steam including

an amoutt of ammonium ions to produce an ammonium ion concentration in the vapor phase condensate of said wet steam effective to inhibit the permeability damage of said formation in the vicinity of the vapor phase, and

an amount of a bicarbonate salt of the alkali metals, or mixtures thereof, effective to raise the pH of the liquid phase of said wet steam to with in the range of from about 8.5 to about 9.5, and

an amount of a potassium salt in the liquid phase of said wet steam effective to inhibit permeability damage of said

formation in the vicinity of the liquid phase of said wet steam; and

(b) monitoring the pH of the residual liquid phase and continually adjusting the addition of said bicarbonate salt to maintain the pH within the range of from about 9.5 to about 9.5.

4,802,534

METHOD AND DEVICE FOR MANIPULATING FERROFLUIDS FOR USE IN CEMENTING WELLS

David B. Larson, and Erik B. Nelson, both of Broken Arrow, Okla., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Continuation-in-part of Ser. No. 798,527, Nov. 15, 1985, Pat. No. 4,691,774. This application Sep. 4, 1987, Ser. No. 92,938

Int. Cl.[4] E21B *33/14, 43/00*

U.S. Cl. 166—381 **20 Claims**

1. A device for manipulating ferrofluids in a wellbore annulus between a pipe or casing and walls of a well, comprising:

(a) means for generating a plurality of alternating magnetic fields distributed in a radial manner, said fields extending into a ferrofluid in the wellbore annulus separating the casing and walls of a subterranean formation; and

(b) means for moving said plurality of magnetic fields relative to the ferrofluid, to facilitate movement of the ferrofluid.

11. A method for manipulating ferrofluids in a wellbore annulus between a pipe or casing and walls of a well, comprising the steps of:

(a) generating at least one magnetic field by a permanently magnetized casing, said magnetic field extending into a ferrofluid in the wellbore annulus separating the casing and walls of a subterranean formation; and

(b) moving said casing relative to the ferrofluid, to facilitate movement of the ferrofluid.

4,802,535

FIRE-FIGHTING TOOL

Arlan N. Bakke, Rte. 1, Cushing, Minn. 56443

Filed Jan. 27, 1987, Ser. No. 7,182

Int. Cl.[4] A62C *31/22*

U.S. Cl. 169—70 **20 Claims**

1. A portable fire-fighting tool, comprising:

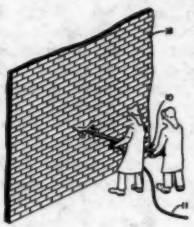
(a) an elongated section of steel pipe having forward and rearward end portions and having a hollow interior and a hollow generally conically-shaped forward end portion in fluid communication with said interior;

(b) a pointed, steel, piercing element carried by said forward end portion and extending forwardly therefrom, said piercing element being constructed and arranged to pierce the wall or roof of a burning building when rammed forcefully thereagainst to thereby extend, with said forward end portion, into the interior of such a building;

(c) said hollow forward end portion having wall structure with a plurality of openings extending therethrough and bringing the interior thereof into fluid communication with the interior of such a building when the wall or roof of the latter is so pierced by said piercing element and said forward end portion of said pipe;

(d) a tubular connector coupling mounted on intermediate portions of said pipe and connected in fluid communication with the hollow interior of said pipe, said connector coupling being constructed and arranged to be connected in fluid communication with a fire hose to receive water under pressure therefrom; and

said openings of said hollow end portion being constructed and arranged to maintain said forward end portion within the interior of such a building in wall-piercing position



after it has pierced such a wall and extended into the interior of such a building, whereby a fire within the interior of the building will be quickly extinguished by a spray of water emanated from said openings of said hollow end portion when pressurized water is admitted into the fire hose, and toward that end;

(f) some of said openings being directed rearwardly and arranged to produce streams of water emanating therethrough in non-intersecting relation to streams of water emanating from all other of said openings in said wall structure.

4,802,536

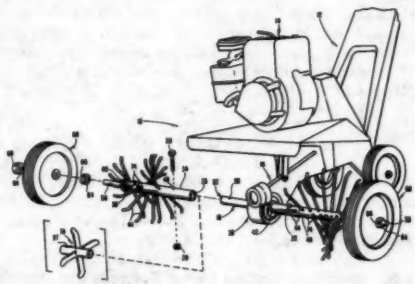
LAWN DETHATCHER FOR A ROTARY CULTIVATOR

Ronald L. O'Neal, R.R. 2, Box 416, Sayre, Pa. 18840

Continuation-in-part of Ser. No. 924,919, Oct. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 789,740, Oct. 21, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 146,963

Int. Cl.[4] A01B *33/14, 45/02*

U.S. Cl. 172—42 **8 Claims**



1. A lawn dethatcher for use with a rotary cultivator having a rotatably driven shaft with a first end and a second end and removably affixed cultivating tines disposed at said first end and at said second end, comprising:

lawn dethatcher means selectively interchangeable with the cultivating tines, including a first rigid sleeve member with a third end and a forth end, a second rigid sleeve member with a fifth end and a sixth end, and a plurality of

rigid dethatchment tines and received through and removeably affixed in helical array to said first rigid member between said third end and said fourth end, and received through and removeably affixed in helical array to said second rigid member between said fifth end and said sixth end in mirror image relationship to said dethatchment tines affixed between said third end and said fourth end;

attachment means to removably affix said lawn dethatcher means at said first end and said second end to the rotatably driven shaft of a rotary cultivator;

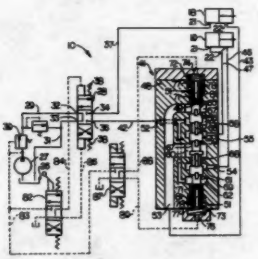
and support means associated with each of said rigid sleeve members to position said lawn dethatcher means at the proper to dethatch grass lawns, said support means being operable free from the rotational influence of the rotatably driven shaft.

4,802,537

CONTROL CIRCUIT FOR POSITIONING AND TILTING AN EARTHMOVING BLADE

Lee T. Ryerson, Graymont, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 20, 1985, Ser. No. 778,462
Int. Cl.[4] E02F *3/85*; F15B *13/06*
U.S. Cl. 172—812 **8 Claims**



1. A fluid control circuit for an earthmoving blade suitably supported on a vehicle so that the tilt and tip positioning of the blade relative to the ground is controlled by first and second double-acting fluid pressure cylinders, each of which has a head end port and a rod end port, comprising:

a tank;

a pump;

a single control valve having an inlet port connected to the pump, an exhaust port connected to the tank, and first and second control ports, said control valve being movable to a first position at which fluid from the pump is directed through said first control port and to a second position at which fluid from said pump is directed through the second control port, said first control port being connected to one of the ports of the first cylinder; and

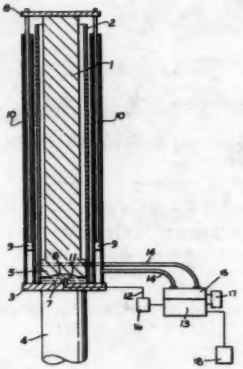
a selector valve connected to the second control port of the control valve, to the other port of the first cylinder, and to the ports of the second cylinder, said selector valve being movable to a first position to provide fluid powered dual cylinder tilting of the blade wherein the first cylinder extends and the second cylinder retracts when the control valve is moved to one of said positions and the first cylinder retracts and the second cylinder extends when the control valve is moved to the other of said positions, a second position to provide fluid powered dual cylinder tipping of the blade wherein the first and second cylinders both extend when the control valve is moved to said one position and retract when the control valve is moved to said other position, and to a third position to provide fluid powered single cylinder tilting of the blade wherein the second cylinder is hydraulically locked at a fixed position and the first cylinder extends and retracts when the control valve is moved to said one and said other position respectively.

4,802,538

PILING HAMMER

Brian Hays, 17 Falstone Crescent, Ashington, Northumberland, and Clive Taylor, 16 All Saints Road, Shildon, County Durham, both of England

Filed Feb. 20, 1986, Ser. No. 832,102
Int. Cl.[4] B21J *7/06*
U.S. Cl. 173—1 **8 Claims**



1. A method of driving a pile into the ground, comprising disposing said pile uprightly upon or at least partly within the ground with an upper end of the pile projecting out of the ground, confining a quantity of a hydraulic fluid in a chamber which is in direct or indirect impact-transmitting contact with the upper end of said pile, striking the upper surface of said hydraulic fluid by allowing a substantial weight to drop thereon, detecting a resulting increase in the pressure of said hydraulic fluid and automatically lifting said weight to a desired height in response to the detection of said resulting pressure increase, and automatically allowing the weight to drop.

4,802,539

POLYCRYSTALLINE DIAMOND BEARING SYSTEM FOR A ROLLER CONE ROCK BIT

David R. Hall, Provo, Utah, and Donald G. Cross, Laguna Beach, Calif., assignors to Smith International, Inc., Irvine, Calif.

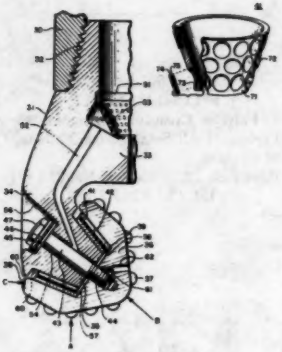
Division of Ser. No. 864,681, May 19, 1986, Pat. No. 4,738,322, which is a continuation-in-part of Ser. No. 684,849, Dec. 20, 1984, abandoned. This application Jan. 11, 1988, Ser. No. 141,829
Int. Cl.[4] F21B *10/46*
U.S. Cl. 175—329 **20 Claims**

1. A roller cone rock bit comprising:

a main bit body with at least one downwardly extending leg, said leg having a journal thereon, said journal having a frusto-conically shaped main journal bearing surface which comprises polycrystalline diamond;

a roller cone rotatively mounted on each journal, said roller cone having a main roller cone bearing surface which

mates with the main journal bearing surface and which comprises polycrystalline diamond; and



means for maintaining the two bearing surfaces in a state of compression against each other.

4,802,540

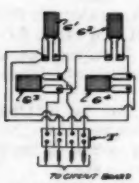
ELECTRONIC WEIGHING SCALES

Bosko Grabovac, Arcadia, and Zlatko Kurtovic, Walnut, both of Calif., assignors to Consolidated Devices Inc., City of Industry, Calif.

Filed Jan. 29, 1988, Ser. No. 150,034

Int. Cl.[4] G01G *3/14, 21/28;* G01L *1/22*

U.S. Cl. 177—211 **16 Claims**



1. A weighing scales comprising a normally laterally and torsionally stable elongate vertical load-supporting and force-conducting rod with an elongate upper reaction portion, an elongate lower working portion and an elongate central tension portion, said tension portion is less in cross-sectional extent than and extends between the reaction and working portions; a plurality of resistance-type strain gauges fixed to the tension portion in predetermined spaced relationship thereon and relative to each other; an elongate vertical housing with upper, central and lower portions is engaged about the rod between the upper and lower terminal end portions thereof; anchoring means secures the reaction portion of the rod in and with the upper end portion of the housing with the tension and working portions of the rod extending through and depending from the central and lower portions of the housing with free working clearances, a window opening in the housing; a circuit board mounted within the housing and carrying an electric digital display device visible through the window and a bridge circuit with a signal output connected with the digital display device and in which the strain gauges on the rod are connected, a variable resistance device with a manually engageable operating part accessible at the exterior of and carried by the housing and connected in the circuit and operating to selectively null an output signal from the circuit to the display device, a power supply battery mounted in the housing and connected with a power input of the circuit.

4,802,541

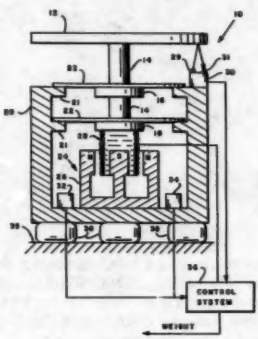
WEIGHING SCALE WITH VOICE COIL

Feliks Bator; Kevin D. Hunter, both of Stratford, and Robert T. Durst, Jr., Monroe, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 11, 1988, Ser. No. 166,859

Int. Cl.[4] G01G *7/00, 23/06*

U.S. Cl. 177—212 **9 Claims**



1. A weighing scale of the force balance transducer type for weighing articles, the combination comprising:

a housing,

a tray,

support means secured to said tray and received within said housing,

at least one spring attached at one location to said support means and at another location to said housing, wherein said tray is operative to move vertically,

said tray having a rest position when supported solely by said at least one spring without any article on said tray,

sensing means for sensing the position and velocity of movement of said tray in response to an article being placed upon said tray,

a voice coil attached to said support means and to said housing,

means for providing a current to said voice coil in response to said location sensor sensing when said tray is moved downwardly from said rest position and to return said tray to its rest position after an article to be weighed has been placed on said tray,

means for measuring the current in said voice coil,

means for controlling the current to said voice coil in response to the position and velocity of said tray so as to expedite the return of said tray to its rest position, and

means for determining the weight of an article on said tray in

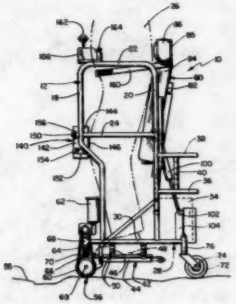
response to the measured current required to hold said tray at its rest position after an article has been placed thereon.

4,802,542

POWERED WALKER

Thomas T. Houston, Erie, and Raymond H. Metzger, Wheat Ridge, both of Colo., assignors to Falcon Rehabilitation Products, Inc., Commerce City, Colo.

Filed Aug. 25, 1986, Ser. No. 899,890
Int. Cl.[4] B60K *1/02, 7/00*; A61G *5/00*
U.S. Cl. 180—65.5 **19 Claims**



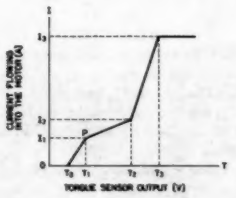
19. In a powered walker apparatus having a frame assembly defining a central space for containing an operator in a standing position, means for selectively moving said apparatus over a ground surface and gate means for closing an entryway into said central space and adapted to define the front surface of said apparatus when in a closed position, the improvement comprising seat assembly means having a seat member movable between a substantially horizontal position within said central space wherein said operator is maintained in a sitting position and a substantially vertical position wherein said operator is maintained in said standing position within such central space, said seat member being further movable between a first and a second horizontal position, said first horizontal position being defined within said central space, and said second horizontal position projecting forwardly outwardly of said frame assembly to permit said operator ready access to said seat member from the exterior of said powered walker apparatus.

4,802,543

ELECTRIC POWER STEERING DEVICE

Hisatsugu Ishikura, and Shigeki Saito, both of Katsuta, Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Eng. Co., both of Tokyo, Japan

Filed Apr. 22, 1987, Ser. No. 41,225
Claims priority, application Japan, Apr. 22, 1986, 61-91249
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **2 Claims**



1. In an electric power steering device operatively positioned between a steering wheel and a steering mechanism of a vehicle:

torque sensing means for detecting torque applied to the steering wheel for producing an electrical signal related to the amount of said torque;

an electrically powered actuator means for generating rotational assist torque to provide an auxiliary steering force to the vehicle steering mechanism;

control means responsive to the electrical signal supplied by the torque sensing means for producing an electric current to drive said actuator means in a direction corresponding to the direction of movement of the steering wheel to thereby generate a rotational assist torque;

said control means being effective to maintain said drive electric current zero when the applied torque is smaller than a predetermined value that is less than when static friction is overcome and rotational assist torque occurs;

said control means further being effective to provide a constant proportional relationship between said electric current and said applied torque when said applied torque exceeds said predetermined value until the applied torque causes initiation of rotational assist torque from said actuator means; and

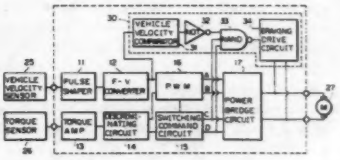
wherein a second proportional relationship between said electric current and said applied torque is provided after rotational assist torque is initiated, said second proportional relationship being less than said constant proportional relationship.

4,802,544

ELECTRIC POWER STEERING APPARATUS HAVING MOTOR BRAKING FUNCTION

Naoyuki Maeda, Aichi, Japan, assignor to Tokai TRW & Co., Ltd., Aichi, Japan

Filed Dec. 7, 1987, Ser. No. 130,101
Claims priority, application Japan, Dec. 9, 1986, 61-292759
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **2 Claims**



1. An electric power steering apparatus comprising:

an electronic control circuit adapted to output a drive signal which has a vehicle velocity response characteristic and a steering response characteristic in response to a vehicle velocity, a steering torque, and a steering direction;

a motor for assisting a steering force which is made operative by said drive signal;

said electronic control circuit having a braking control circuit to short-circuit between both terminals of said motor when a steering operation is stopped and the supply of said drive signal to said motor is stopped in its running state when said vehicle velocity exceeds a predetermined value;

said braking control consisting of:

a vehicle velocity comparator having a reference value corresponding to said predetermined value of vehicle velocity;

a gate circuit adapted to output a braking command signal in response to an output signal of said vehicle velocity comparator and the stop of said steering operation; and

a braking drive circuit adapted to short-circuit between both terminals of said motor in response to said braking command signal.

4,802,545

STEERING CONTROL SYSTEM FOR ARTICULATED VEHICLE

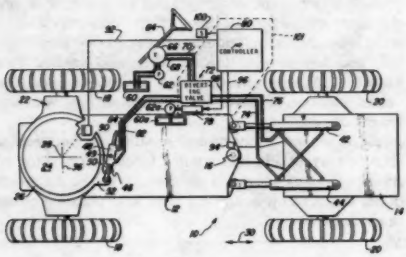
Paul A. Nystuen; Barry D. Batcheller, both of West Fargo; Kevin L. Brekkestran, Fargo, and Calvin J. Kraning, Valley City, all of N. Dak., assignors to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 919,172, Oct. 15, 1986, Pat. No. 4,771,851. This application Oct. 15, 1987, Ser. No. 109,661

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] B62D *5/06, 12/00*

U.S. Cl. 180—135 12 Claims



1. An improved steering system for an articulated vehicle of the type having first and second frame portions each provided with at least one pair of ground-engaging wheels, with the wheels associated with the first frame portion being mounted for pivotable wheel steering through pivoting movement of such wheels with respect to the first frame portion, first hydraulic actuator means for pivoting the wheels of the first frame portion with respect to the first frame portion, and second hydraulic actuator means for articulated steering by articulating the first and second frame portions relative to one another, the improvement comprising:

first means for determining the degree of pivot of at least one wheel of the first frame portion relative to the first frame portion;

second means for determining the degree of articulation of the first and second frame portions;

steering control means for selecting the direction of vehicle travel, including a manual steering member, at least first and second hydraulic fluid conduits, and hydraulic valve means for directing pressurized hydraulic fluid to the first conduit when movement of the manual steering member by a vehicle operator indicate the vehicle is to turn toward a first direction and to the second conduit when movement of the manual steering member by the vehicle operator indicates the vehicle is to turn in a second opposite direction; and

system control means for controlling the first and second hydraulic actuators in response to said degree of pivot, said degree of articulation and the pressurized hydraulic fluid in the first and second conduits, including electrically operated hydraulic control valve means, in hydraulic fluid communication with the first and second conduits and the first and second hydraulic actuator means, for diverting the flow of pressurized hydraulic fluid in the first and second conduits sequentially between the first and second hydraulic actuators to effect steering of the vehicle by pivotable wheel steering and articulation steering.

4,802,546

STEERING APPARATUS FOR A VEHICLE

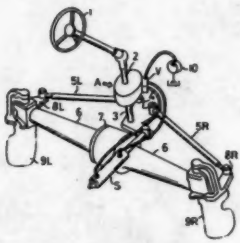
Shigenori Sakikawa, Itami, and Toshiaki Okanishi, Kobe, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Japan

Filed Jan. 19, 1988, Ser. No. 144,972

Claims priority, application Japan, Jan. 19, 1987, 62-6878[U]; Jun. 2, 1987, 62-85954[U]

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—132 2 Claims



1. A steering apparatus for a vehicle characterized in that

a first sun gear (2*a*) fixed to a handle shaft (2) at a handle (1) of a vehicle, planetary gears (14*a*) and (14*b*), and a ring gear (15) constitute a first planetary gear train,

a first carrier (17) supporting said planetary gears (14*a*) and (14*b*) at said first periphery gear train is fixed to a second sun gear (19) at a second planetary gear train,

said second sun gear (19), planetary gears (20*a*) and (20*b*), and a ring gear (25) constitute a second planetary gear train,

a second carrier (30) supporting said planetary gears (20*a*) and (20*b*) is fixed to a steering wheel side shaft (3),

said ring gear (25) at the second planetary gear train is fixed to a steering case (12), said ring gear (15) at the first planetary gear train being made rotatable and desirably stationary within said steering case (12), and

a steering valve switching member (11) provided at the outer periphery of said ring gear (15) and rotatable in a predetermined range with respect to said steering case (12) enables a steering hydraulic valve (V) to be desirably switched in order to steer said vehicle.

4,802,547

GOLF CART

Eiji Nakasaki, Kakogawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Dec. 22, 1987, Ser. No. 136,565

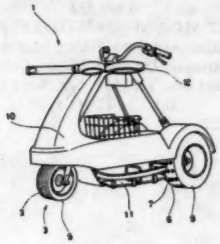
Claims priority, application Japan, Dec. 26, 1986, 61-311327

Int. Cl.[4] B62D *61/08;* B60C *9/02*

U.S. Cl. 180—216 3 Claims

1. A golf cart having: a front wheel including a tire which is inflated to a low air pressure of 0.1 to 1.0 kg/cm^2, having a carcass of a bias ply construction and the tread of which is provided with a plurality of circumferentially extending grooves; and a rear wheel including a beltless tire which is

inflated to a low air pressure of 0.1 to 1.0 kg/cm^2, having a carcass of a radial ply construction and the tread of which is



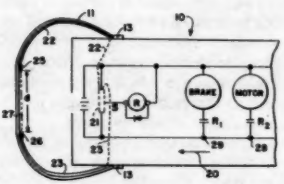
substantially smooth and provided with a plurality of spikes for traction.

4,802,548

AUTOMATIC GUIDED VEHICLE SAFETY SYSTEM

James R. Kausch, Newport News, Va., assignor to Munck Automation Technology, Inc., Newport News, Va.

Filed Dec. 21, 1987, Ser. No. 135,984
Int. Cl.[4] B60K *28/10*
U.S. Cl. 180—274 **8 Claims**



1. In combination with an automatic guided vehicle,
deflectable bumper means mounted on the vehicle and adapted to signal contact with an obstruction;
a light source mounted on the vehicle and forming part of an electric circuit;
fiber optic emitter means in operative connection with said light source for transmitting a light signal therefrom;
fiber optic receiver means in spaced optical alignment with said emitter means for receiving a light signal optic emitter means and said
both said fiber optic emitter means and said fiber optic receiver means being secured to said deflectable bumper means and moveable therewith;
said fiber optic emitter means and said fiber optic receiver means when in optical alignment serving to complete an electric circuit that permits said automatic guided vehicle to operate; and,
whereby when said deflectable bumper means contacts an obstruction said bumper will deflect and move said at least one of said fiber optic emitter means and said fiber optic receiver means out of optical alignment to thereby open the electric circuit and cause said automatic guided vehicle to stop.

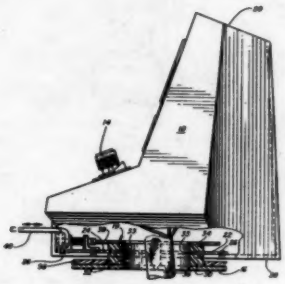
4,802,549

CENTRAL ROTATING TERMINAL FOR VEHICLES

Mario J. Martinez, Elgin, Ill., assignor to Elgin Sweeper Company, Elgin, Ill.

Filed Jul. 30, 1987, Ser. No. 79,809
Int. Cl.[4] B60K *26/00*; B62D *1/22*
U.S. Cl. 180—322 **17 Claims**

1. In a vehicle having first and second driver's seats and a control console, said driver's seats being in side-by-side relation, the improvement comprising, in combination:
pivot means carrying said control console to permit said console to pivot between at least a first positon facing said first driver's seat and a second position facing said second



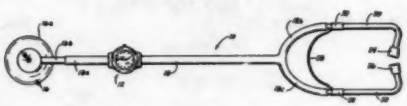
driver's seat, said pivot means comprising a rotatable plate member attached to said control console and a ring member carried in stationary manner in said vehicle, said plate member resting on and being slidably rotatable with respect to said ring member.

4,802,550

CHRONO-STETHOSCOPE

Henry B. Poore, 1003 McFarland St., Norman, Okla. 73069

Filed Sep. 11, 1987, Ser. No. 95,828
Int. Cl.[4] A61B *7/02*
U.S. Cl. 181—131 **17 Claims**



1. A chrono-stethoscopic device comprising:
a stethoscope including:
a pickup head;
an elongated, flexible, tubular sound conveyance channel element having a first end connected to said pickup head, and having a second end; and
a pair of ear pieces connected to said second end;
a timepiece; and
means for detachably and adjustably movably securing said timepiece to said elongated flexible tubular sound conveyance channel element at a position which is located between said pickup head and said ear pieces and not more than ten inches from said pickup head.

4,802,551

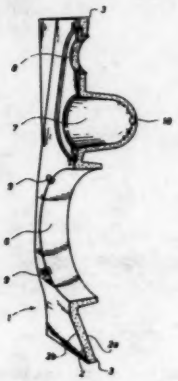
LOUDSPEAKER UNIT

Preben Jacobsen, Glyngøre, Denmark, assignor to Jamo Hi-Fi A/S, Glyngøre, Denmark

Filed Jul. 2, 1986, Ser. No. 881,247
Claims priority, application Denmark, Jul. 5, 1985, 3093/85
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—146 **2 Claims**

1. A front plate of a loudspeaker unit, including:
a hollow body having a plurality of joined inner, outer and edge walls;
said walls defining, on said front plate, at least one opening through which a loudspeaker, when mounted in the opening, may project sound;

said walls of said hollow body enclosing an interior cavity; said interior cavity being filled with a filling of a mixture of a foamed plastic material and sand having a grain size in a



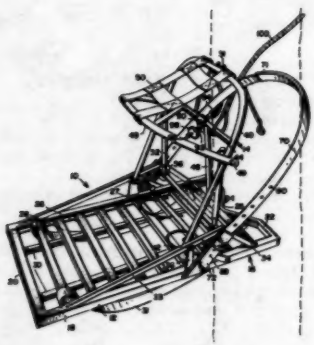
range of about 1.5–2.0 mm and a specific gravity which is greater than that of said foamed plastic material, whereby said hollow body is substantially without acoustical resonance.

4,802,552

COMBINED CLIMBING AND HANG-ON TREE STAND WITH OPTIONAL CLIMBING AID

Ralph D. Williams, Haughton, La., assignor to Loggy Bayou Industries, Shreveport, La.

Filed Jul. 28, 1987, Ser. No. 78,677
Int. Cl.[4] A45F 3/26; A47C 9/10
U.S. Cl. 182—187 **39 Claims**



1. A tree stand comprising:

a platform having opposite edges with one edge engageable with a tree; said

elongated means secured at its opposite ends to platform and extendable about the tree for engagement with the other side of the tree from the platform and at an elevation above the elevation at which the one platform edge is engageable with the tree; and

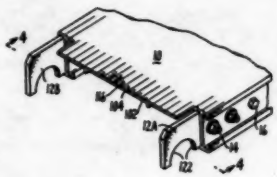
a seat carried by and upstanding from said platform, and said seat having a frame element for engagement with the tree at an elevation therealong different from the elevation of the engagement of the tree stand platform and said elongated means, whereby the tree stand is engageable with the tree at three discrete elevationally different locations affording support and stability to the stand.

4,802,553

ALUMINUM SCAFFOLD PLANK

Herman H. Waters, and John White, both of Magnolia, Ark., assignors to Alumax, Inc., San Mateo, Calif.

Filed Jun. 16, 1987, Ser. No. 63,572
Int. Cl.[4] E04G 5/08
U.S. Cl. 182—222 **7 Claims**



1. A scaffolding plank without interjacent gaps for use with a scaffolding frame comprising:

a. a support platform having a first end, a second end, a top surface and a bottom surface;

b. a plurality of grasper hooks, each of said hooks having a scaffolding frame receiving aperture, certain of said hooks affixed to said first end and a remainder of said hooks affixed to said second end, a portion of each of said hooks extending beyond said first end and said second end;

c. a first tongue member extending from said first end and a second tongue member extending from said second end, each of said tongue members being positioned so as not to interfere with said hooks, said tongue members extending nearly to a center of said aperture;

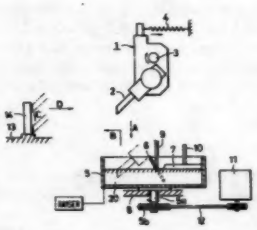
d. vertical support members positioned on said bottom surface and further wherein each of said vertical support members extends along the length of the bottom surface and further comprises an I-beam having a vertical web and horizontal upper and lower flanges attached to the web, and wherein the flanges are bent over to form slots for receiving an end of one of the grapser hooks, said slots being dimensioned so as to be substantially filled by the end of the grasper hook.

4,802,554

GREASE APPLYING METHOD

Naoto Takayama; Yuzo Tsunekawa, and Kazumi Kitamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 11, 1988, Ser. No. 142,593
Claims priority, application Japan, Jan. 9, 1987, 62-2659
Int. Cl.[4] F16N 7/00
U.S. Cl. 184—14 **8 Claims**



1. A grease applying method in which a precisely measured

quantity of grease is applied to a desired part, comprising the steps of:

placing a supply of grease in an open storing means;

continuously stirring and leveling the grease in said storing means;

dipping grease applying means into said grease through the surface thereof;

pulling said applying means with grease adhered to at least an end portion thereof; and

moving said applying means to a part to be lubricated to apply grease adhered to said applying means to said part.

4,802,555

OIL SUPPLY SYSTEM

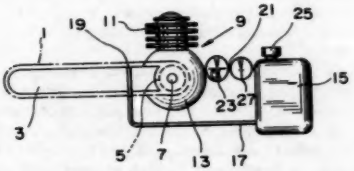
Takao Matsunaga, Tachikawa; Kazuo Nakajima, Sayama, and Masaki Kobayashi, Kodaira, all of Japan, assignors to Komatsu Zenoah Co., Japan

Continuation of Ser. No. 276,037, Jun. 22, 1981, abandoned. This application Dec. 6, 1983, Ser. No. 558,694

Claims priority, application Japan, Feb. 13, 1981, 56-018245[U]

Int. Cl.⁴ F16N 7/14

U.S. Cl. 184—15.1 **4 Claims**



1. An oil supply system for a chain saw including a saw chain powered by an internal combustion engine having a crankcase, said system lubricating the saw chain and comprising:

a lubricating oil reservoir;

air passage means communicating between said oil reservoir and the crankcase of said engine to pressurize said oil reservoir in response to operation of the engine;

means defining an oil communicating passage without a flow adjusting means between said oil reservoir and the saw chain to be lubricated, so that oil can flow to the chain from said pressurized oil reservoir; and

adjustable valve means associated with said air passage means and selectably operative to adjust the amount of air supplied through said air passage means to said oil reservoir from the engine;

so as to selectably adjust the amount of oil flowing through said oil communicating passage and applied to lubricate the saw chain without requiring a means in the oil communicating passage to adjust the flow of oil therethrough.

4,802,556

AUTOLUBER

Michael L. Lauber, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 1, 1983, Ser. No. 518,886

Int. Cl.⁴ F16N 7/12; B29H 17/10

U.S. Cl. 184—102 **1 Claim**

1. An apparatus for applying a liquid to a tire shaping drum comprising:

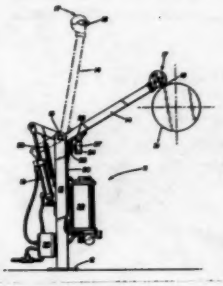
(a) base means;

(b) pivot means pivotable about said base means;

(c) fluid actuator means affixed to said pivot means and associated with said base means to cause said pivot means to pivot about said base means in response to actuation of said fluid actuator means;

(d) liquid absorbing means associated with said pivot means;

(e) liquid pumping means adapted to provide liquid to said liquid absorbing means through a conduit in constant fluid communication with said pumping means and said absorbing means wherein the liquid pumping means provides liquid to the liquid absorbing means in response to the pivoting of the pivot means about said base mean.



4,802,557

WAIT TIME PREDICTION APPARATUS FOR ELEVATOR

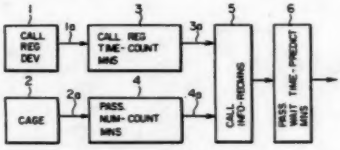
Yasukazu Umeda, and Shintaro Tsuji, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 24, 1987, Ser. No. 17,695

Claims priority, application Japan, Feb. 25, 1986, 61-39615

Int. Cl.⁴ B66B 1/18

U.S. Cl. 187—127 **6 Claims**



1. A wait time prediction apparatus for an elevator comprising call registration time-counting means for counting registration times of calls which have been registered in order to assign cages, passenger number-counting means for counting numbers of passengers who get on the cages serving the calls, call information-recording means for recording the call registration times and the numbers of passengers for the respective calls for a predetermined number of calls, and passenger wait time-predicting means providing a predictive summation of the actual waiting times of individual passengers getting on an elevator which serves a call after a predetermined time from the registration of the call on the basis of outputs of said call information-recording means.

4,802,558

APPARATUS PROVIDING ENVIRONMENTAL AND MECHANICAL PROTECTION FOR BALL SCREW DRIVES

Donald W. Garnett, Grand Ledge, Mich., assignor to The Olofsson Corporation, Lansing, Mich.

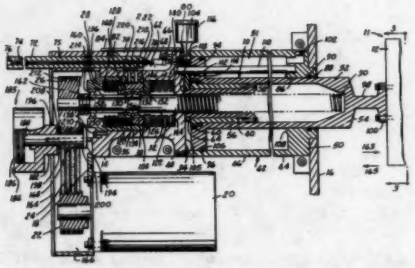
Filed Oct. 1, 1987, Ser. No. 103,208

Int. Cl.⁴ B60T 7/12

U.S. Cl. 188—134 **14 Claims**

1. In apparatus having a movable member, a drive for said member including a screw, a nut mounted on said screw to move axially in response to rotation of said screw, a tubular member connected to said nut, said tubular member extending

lengthwise of and surrounding said screw and having a closed end across one end of said screw, means connecting said closed end of said tubular member to said movable member, means including a casing defining a substantially closed chamber housing said nut, screw and tubular member, means in a wall of



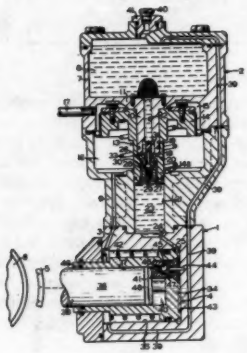
said casing defining an opening through which the closed end of said tubular member extends, means for sealing said opening to exclude foreign matter from said chamber, said casing having an annular wall, said tubular member having a piston slidable along said wall, and sealing means carried by said piston and contacting said wall to exclude foreign matter.

4,802,559

HYDROPNEUMATIC BRAKE ACTUATOR ARRANGED TO MAINTAIN A CONSTANT BRAKE SHOE CLEARANCE

Eugene Fourie, Brooklyn, South Africa, and Steven C. Rumsey, Greer, S.C., assignors to American Standard Inc., Spartanburg, S.C.

Filed Feb. 3, 1988, Ser. No. 151,738
Int. Cl.[4] F16D 65/72
U.S. Cl. 188—196 A **6 Claims**



1. A hydraulic brake actuator for operating brake means relative to a member to be braked comprising:

(a) a cylinder body having a bore therein terminating in an end wall;

(b) a force piston operatively-disposed in said cylinder bore and forming, in cooperation therewith, a first chamber;

(c) means for yieldably exerting a force on said force piston to urge movement thereof to a brake release position in which said force piston is engageable with said end wall of said cylinder bore;

(d) a bore in said force piston;

(e) a take-up piston operatively-disposed in said force piston bore and cooperating therewith to provide a second chamber, said take-up piston being connected to said brake means;

(f) a fluid flow path in said force piston interconnecting said first and second chambers, said take-up piston being movable in a brake application direction relative to said force piston in response to the supply of fluid under pressure to said first and second chambers, said movement of said take-up piston effecting such volumetric expansion of said first and second chambers as to prevent the fluid pressure force acting on said force piston from exceeding said yieldable force, thereby preventing actuation of said force piston from said release position until said movement of said take-up piston is arrested;

(g) check valve means for controlling fluid pressure communication between said first and second chambers comprising:

(i) a valve seat formed in said force piston in surrounding relationship with said flow path;

(ii) a valve member cooperatively arranged relative to said valve seat;

(iii) a pin fixed to said end wall so as to project into said flow path and displace said valve member from said valve seat a predetermined distance in said release position of said force piston, whereby fluid pressure communication is established between said first and second chambers during said movement of said take-up piston in said brake application direction relative to said force piston;

(iv) a bias spring acting on said valve member in a direction urging engagement of said valve member with said valve seat, whereby said fluid pressure communication between said first and second chambers is interrupted in response to said actuation of said force piston and distance corresponding to said predetermined distance; and

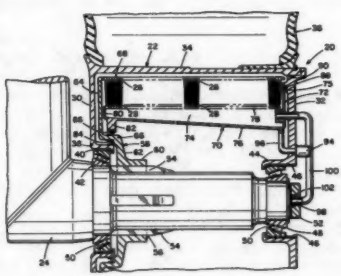
(h) friction means for exerting a friction force between said force piston and said take-up piston to prevent relative movement therebetween during said movement of said force piston to said release position, whereby said brake means is retracted from said member to be braked at least said predetermined distance to provide positive clearance therebetween.

4,802,560

COMBINED WHEEL/BRAKE APPARATUS USING ELECTRO-RHEOLOGICAL FLUID

Dilip K. Bhadra; Richard L. Creedon, both of San Diego; C. Ross Harder, Rancho Santa Fe, and Bourque, Robert F., San Diego, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Jan. 27, 1988, Ser. No. 148,970
Int. Cl.[4] F16D 65/78, 27/00
U.S. Cl. 188—264 F **13 Claims**



1. Combined wheel/brake apparatus, employing electro-rheological fluid, for mounting on an axle, said apparatus comprising:

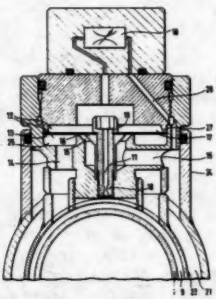
a wheel rotatably mounted on said axle;
a first plurality of spaced, electrically and thermally conductive vanes extending in a first direction, and held fixed by said axle;
a second plurality of spaced, electrically and thermally conductive vanes extending in a direction opposite said first direction, interdigitated with but not contacting said first plurality of vanes carried by said wheel and electrically insulated from said first plurality of vanes;
an electro-rheological fluid disposed between said first and second pluralities of vanes, at least some of said vanes having a coolant passageway; and
means for supplying a coolant to the coolant passageways, said coolant passageways being isolated from said electro-rheological fluid whereby application of an electrical potential across said two pluralities of vanes causes an increase in the viscosity of said electro-rheological fluid among said vanes to develop a braking force, heat occasioned by the braking being transmitted to said coolant.

4,802,561

ADJUSTABLE SHOCK ABSORBER

Heinz Knecht, and Norbert Ackermann, both of Eitorf, Fed. Rep. of Germany, assignors to Boge AG, Eitorf, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 24,831
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609862
Int. Cl.[4] B60G *17/08*; F16F *9/50*
U.S. Cl. 188—318 **29 Claims**



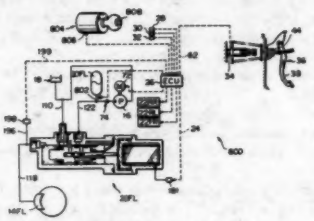
1. An adjustable shock absorber, comprising:
a sealed cylinder containing a damping fluid;
a piston rod sealingly projecting into said cylinder and axially displaceable with respect thereto;
a piston attached to said piston rod and disposed within said cylinder to thereby sealingly divide said cylinder into first and second chambers;
a wholly mechanical throttle valve connecting said first and second chamber for varying the damping of said adjustable shock absorber;
said wholly mechanical throttle valve comprising:
a flexible membrane having a first side, a second side, an inner portion and an outer peripheral portion;
means for prestressing said membrane;
a valve seat disposed adjacent said first side of said flexible membrane;
a first passageway for admitting fluid on one side of said valve seat; and a second passageway for expelling fluid on another side of said valve seat,
said valve seat comprising an edge between said first passageway and said second passageway;
a control chamber disposed at said second side of said membrane; a controlled chamber disposed at said first side of said membrane; a principal bypass interconnecting said first and second chambers through said first and second passageways and said controlled chamber; and
continuously open, internal bypass means for connecting said control chamber with said first passageway, for admitting fluid, to pressurize said control chamber;
said shock absorber further comprising:
control bypass means, external to said wholly mechanical throttle valve, connecting aid second passageway, for expelling fluid, with said control chamber.

4,802,562

ELECTRONICALLY CONTROLLED BRAKING SYSTEM WITHOUT A MASTER CYLINDER

Masatoshi Kuroyanagi, Kariya; Kazuma Matsui, Toyohashi; Youzou Majima, and Fumiaki Murakami, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 13, 1987, Ser. No. 25,841
Claims priority, application Japan, Mar. 17, 1986, 61-58990; May 2, 1986, 61-102742
Int. Cl.[4] B60K *41/20*; B60T *8/62, 11/00*
U.S. Cl. 192—1.23 **16 Claims**



1. An electronically controlled braking system for a wheeled vehicle, which comprises:
a brake operatively associated with the wheel and having a wheel cylinder for applying the brake to retard the rotation of the wheel;
input means actuated by a vehicle operator during brake application;
sensing means associated with said input means for sensing an amount of actuation of said input means and delivering a first electrical signal indicative of said amount;
a source of brake fluid under pressure;
electronic control means responsive to said first signal for delivering a second electrical signal proportional to said first signal; and
pressure modulator means in fluid communication with said source and said wheel cylinder and responsive to said second signal for communicating to said wheel cylinder a fluid pressure proportional to said second signal to apply the brake with a braking force proportional to the amount of actuation of said input means;
wherein said pressure modulator means comprises:
a housing having a cylinder bore, an inlet port in fluid communication with said source, and an outlet port in fluid communication with said wheel cylinder;
a piston received slidably and fluid-tightly in said bore to define therein an output chamber and an input chamber at opposite sides of the piston, said output chamber being in fluid communication with said outlet port, and said piston defining a passage therein for communicating said inlet port with said input chamber;
valve means, including a valve member axially movably received in said piston, for controlling fluid communication through said passage between said inlet port and said input chamber in such a manner that fluid communication between said inlet port and said input chamber is established to allow the brake fluid under pressure to flow into said input chamber to cause the fluid pressure in said input chamber to be raised as the valve member is moved

toward said output chamber, and that fluid communication between said inlet port and said input chamber is interrupted causing the fluid pressure in said input chamber to be lowered as the valve member is moved toward said input chamber; and,

electrically operated positioning means responsive to said second signal and operatively associated with said valve member for positioning said valve member axially with respect to said housing, whereby the piston is moved under the action of the fluid pressure in said input chamber to a position in which fluid pressure in said output chamber is balanced with fluid pressure in said input chamber thereby communicating to said wheel cylinder a fluid pressure which is proportional to the amount of actuation of said input means.

13. An electronically controlled braking system for a wheeled vehicle having an engine ignition switch, which comprises:

(a) a brake operatively associated with the wheel and having a wheel cylinder for applying the brake to retard the rotation of the wheel;

(b) input means actuated by a vehicle operator during brake application;

(c) sensing means associated with said input means for sensing an amount of actuation of said input means and delivering a first electrical signal indicative of said amount.

(d) a source of brake fluid under pressure;

(e) a switch sensor for sensing the position of said ignition switch and delivering a second electrical signal when said ignition switch is closed;

(f) wheel sensor means for sensing the rotation of the wheel and delivering a third electrical signal in response to rotation thereof;

(g) electronic control means responsive to said first signal for delivering a fourth electrical signal proportional to said first signal, said control means being also responsive to said second and third signal and delivering a fifth signal upon receipt of third signal in the absence of said second signal; and,

(h) electrically operated pressure modulator means in fluid communication with said source and said wheel cylinder and responsive to said fourth signal for communicating to said wheel cylinder a fluid pressure proportional to said fourth signal to apply the brake with a braking force proportional to the amount of actuation of said input means, said pressure modulator means being also responsive to said fifth signal to communicate to the wheel cylinder a brake fluid under pressure whereby the brake is applied when rotation of the wheel occurs while said ignition switch is opened,

wherein said pressure modulator means comprises:

a housing having a cylinder bore, an inlet port in fluid communication with said source, and an outlet port in fluid communication with said wheel cylinder;

a piston received slidably and fluid-tightly in said bore to define therein an output chamber and an input chamber at opposite sides of the piston, said output chamber being in fluid communication with said outlet port, and said piston defining a passage therein for communicating said inlet port with said input chamber;

valve means, including a valve member axially movably received in said piston, for controlling fluid communication through said passage between said inlet port and said input chamber in such a manner that fluid communication between said inlet port and said input chamber is established to allow the brake fluid under pressure into said input chamber to cause the fluid pressure in said input chamber to be raised as the valve member is moved toward said output chamber, and that fluid communication between said inlet port and said input chamber is interrupted causing the fluid pressure in said input chamber to be lowered as the valve member is moved toward said input chamber, and,

electrically operated positioning means responsive to said fourth signal and operatively associated with said valve member for positioning said valve member axially with respect to said housing, whereby the piston is moved under the action of the fluid pressure in said input chamber to a position in which fluid pressure in said output chamber is balanced with fluid pressure in said input chamber thereby communicating to said wheel cylinder a fluid pressure which is proportional to the amount of actuation of said input means.

4,802,563

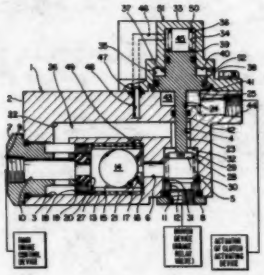
BRAKING FORCE HOLDING DEVICE FOR AN AIR BRAKE SYSTEM

Katsumi Kojima, and Ryota Miki, both of Yokosuka, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Oct. 24, 1986, Ser. No. 924,344

Int. Cl.[4] B60K *41/24*

U.S. Cl. 192—13 A **5 Claims**



1. A braking force maintaining device for an air brake system of a vehicle including a main brake control device that discharges compressed air when operated by a driver of the vehicle, driven device that is actuated by compressed air to brake the vehicle, and an actuator of a clutch operating device that is actuated by compressed air, said braking force maintaining device comprising:

a main body having an inlet port connected to the main brake control device for receiving the compressed air discharged therefrom, an outlet port connected to the driven device, a control port connected to the actuator of the clutch operating device for receiving compressed air therefrom when the actuator is actuated, and an air passage extending between and communicatable with said inlet port and said outlet port;

a valve device comprising a valve seat defined on the main body between said air passage and said outlet port, and a valve body movably seated on said valve seat over said air passage; and

a control unit having a movable member operatively connected to the valve body for moving said valve body between a first position at which the valve body is off of said valve seat and said inlet port communicates with said outlet port through said air passage and a second position at which the valve body is seated on said valve seat to block said inlet port from said outlet port via said air passage, said movable member having a first respective pressure receiving portion upon which when pressure acts the movable member is movable in a direction to move said valve body from said second position to said first position and a second respective pressure receiving portion upon which when pressure acts the movable member is movable in a direction to move said valve body from said first position to said second position, a first chamber constantly open to said outlet poft for receiving compressed air from the driven device to which the outlet port is connected, said first chamber facing said first respective receiving portion of the movable member so that the

compressed air received therein acts on the first respective pressure receiving portion to move said valve body toward said first position, and a second chamber constantly open to said control port for receiving the compressed air received by the control port from the actuator of the clutch control device, said second chamber facing said second respective pressure receiving portion so that the compressed air received therein acts on the second respective pressure receiving portion.

4,802,564

FRICTION-DISC CLUTCH

Enno Stodt, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

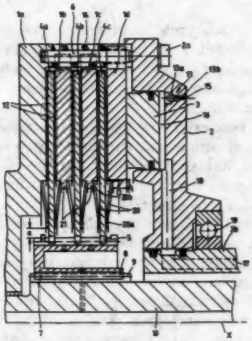
PCT No. PCT/EP86/00685, § 371 Date Jul. 22, 1987, § 102(e) Date Jul. 22, 1987, PCT Pub. No. WO87/03348, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 26, 1986, Ser. No. 90,254

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541755

Int. Cl.[4] F16D *13/69, 13/72*

U.S. Cl. 192—70.28 **15 Claims**



1. A friction-disc clutch comprising a first clutch half and a second clutch half which cooperate for engaging to transmit torque and for disengaging;

(a) the first clutch half comprising a clutch housing; a rotatable shaft within the clutch housing for being drivingly connected to and disconnected from the clutch housing;

an outer friction plate extending around the shaft; the outer friction plate having an outer circumference that is connected with the clutch housing in a rotatably fast manner and in a manner permitting relative axial sliding of the outer friction plate with respect to the clutch housing; the outer friction plate having a first axial side;

(b) the second clutch half comprising an inner friction plate extending around the shaft; the inner friction plate having a second axial side; the inner friction plate having an inner circumference; connection means between the inner circumference of the inner friction plate and the shaft for connecting them rotatably fast while permitting axial sliding of the inner friction plate with respect to the shaft;

(c) the inner friction plate extending radially outwardly and being located axially alongside the outer friction plate; a friction surface being disposed on the second axial side of the inner friction plate which is opposite the first axial side of the adjacent outer friction plate, such that the friction surface on the inner friction plate may contact the first axial side of the outer friction plate when the first and second clutch halves are engaged;

(d) a first actuating element operating upon the outer and inner friction plates to move them into engagement for engaging the clutch; a second actuating element operable for moving the outer and inner friction plates axially apart for disengaging the clutch;

(e) a respective resilient disengaging member extending around the shaft and being disposed between the adjacent inner and outer friction plates; the disengaging member having a third axial side for acting upon the inner friction plate and a fourth opposite axial side for acting upon the adjacent outer friction plate for normally urging the friction surface of the inner friction plate off the first axial side of the outer friction plate;

(f) the disengaging member comprising a Belleville spring around the shaft, the spring being annular and having a radially outer border, and the Belleville spring being shaped and of a diameter such that the radially outer border abuts against a radially inner area, near the inner circumference, of the outer friction plate of the first clutch half;

(g) the outer border of the Belleville spring engaging and rotating at least mostly together with the outer friction plate of the first clutch half;

(h) the Belleville spring having a radially inner border which is spaced radially outwardly from the shaft and abutting against the respective inner friction plate, the radially inner border of the Belleville spring having a sliding surface for sliding over a surface of the inner friction plate, whereby the Belleville spring rotates at least mostly together with the first clutch half.

4,802,565

DEVICE FOR ADJUSTING A SET OF WORKPIECE MOUNTS IN DEFINED WORKING POSITIONS

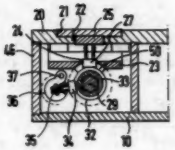
Bernd Berberich, Schwieberdingen, and Holger Reinhold, Freudenstadt, both of Fed. Rep. of Germany, assignors to Tampoflex GmbH, Ditzingen, Fed. Rep. of Germany

Filed Mar. 29, 1988, Ser. No. 174,607

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 3710534

Int. Cl.[4] B65G *21/20, 43/00, 35/08, 23/00*

U.S. Cl. 198—345 **16 Claims**



1. In a device for moving a set of workpiece mounts to work positions of the type with mounts arranged in a given spacing on an endless conveyor moving incrementally around a loop, the spacing corresponding to the length of one incremental movement, the improvement comprising:

a frame;

the mounts being sheds (25) on the frame pivotably connected to each other by elongated strips (28) at spacings corresponding to one incremental movement and which are guided in a guide path (21, 22, 24);

the strip-shed connections having a given play in them in the direction of conveyor movement;

a guide roll (27) connected to each shed in position adjacent to said pivot connections;

a drive shaft (29);

a rotating drive roll (30) on the drive shaft (29) having a groove (43) therein, the guide rolls (27) insertable into the groove (43), said groove (43) extending at least the length of one incremental conveyor movement plus twice the diameter of the guide rolls (27), whereby the shed (25) having its guide roll (27) inserted into the groove (43) can be brought to a defined reference position;

positioning rolls (32) non-rotatably mounted on the drive shaft (29) and having peripheral grooves (33) receiving the guide rolls (27) of the sheds (25) which complete the set of workpiece mounts;

slide members (36) adjustably mounted with respect to the frame and having shift rolls (34) engaged in one of the peripheral grooves (33);

threaded rods (37) rotatably secured to the frame and each extending to one of the slide members (36) for adjustment thereof, the positioning rolls (32) adjustable on the drive shaft (29), by adjustment of the slide members (36), to spacings deviating from the length of incremental conveyor movement.

4,802,566

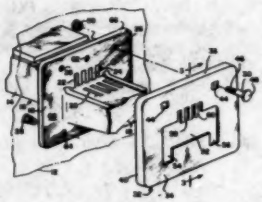
COIN SLIDE GUARD

Evan C. Wilfong, Philadelphia, and Harvey S. Gitlin, Ambler, both of Pa., assignors to Equipment Systems & Devices, Inc., Ambler, Pa.

Filed Aug. 6, 1987, Ser. No. 82,377

Int. Cl.[4] G07F 1/00

U.S. Cl. 194—350 **6 Claims**



1. A coin slide guard for protecting a coin slide mounting flange having an outer periphery and a predetermined thickness and of the type having a plurality of transversely spaced slots with dividers respectively therebetween and a plurality of mounting openings through the mounting flange comprising:

a unitary hardened steel face forwardly overlying the mounting flange, said face including a face outer periphery which terminates in a hollow, peripheral flange having top and bottom walls and joining left and right walls following said outer periphery of said mounting flange, said guard flange walls extending in depth sufficiently to cover the entire peripheral thickness of the coin slide mounting flange,

the face being provided with an opening to receive a portion of a coin slide therethrough,

the opening being upwardly shaped to provide a plurality of transversely spaced slots, the slots being defined by respective protective fingers therebetween,

the face being provided with a plurality of securing openings, at least some of the securing openings in the guard face registering over and aligning with a mounting opening in the mounting flange,

the protective fingers of the guard overlying and protecting the dividers of the mounting flange when the guard securing openings are in registry over the flange mounting openings; and

at lesat one fastener positioned through an aligned pair of mounting opening and securing opening to secure the guard to the coin slide mounting flange.

4,802,567

PLATE PROCESSING MACHINE

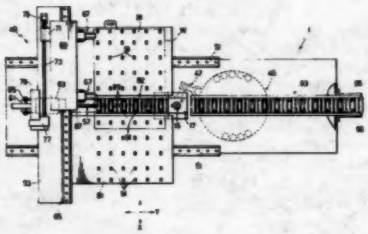
Hidekatsu Ikeda; Hidetoshi Miyama, and Yoshihiko Kashiwahara, all of Kanagawa, Japan, assignors to Amada Company, Limited, Japan

Filed Feb. 4, 1987, Ser. No. 10,855

Claims priority, application Japan, Feb. 6, 1986, 61-15068[U]; Feb. 6, 1986, 61-15071[U]

Int. Cl.[4] B65G 47/22

U.S. Cl. 198—345 **10 Claims**



1. A plate processing machine having a base and two guide members extending in a longitudinal Y-axis direction of the machine and disposed parallel to each other on both ends of a lateral Y-axis direction of the machine, which comprises:

(a) a Y-axis motor;

(b) a carriage base extending for a predetermined distance in the X-axis direction and supported by said two guide members on both ends thereof so as to be movable by said Y-axis motor to and from a process position of the machine in the Y-axis direction;

(c) a carriage (69) having two clamping devices (67) for clamping a workpiece to be processed and mounted on said carriage base so as to be reciprocably movable along said carriage base in the X-axis direction said carriage extending longitudinally in the X-axis direction and having two longitudinal ends, said carriage further being movably connected to a screw rod for driving said carriage, said connection being made at one longitudinal end of said carriage;

(d) a carriage drive unit (77, 79) being drivingly connected to said screw rod near a middle portion of said carriage base to move said carriage under a balanced condition in weight with respect to said carriage base; and

(e) said screw rod having a length which is substantially less than the predetermined distance along which said carriage base extends.

4,802,568

SORTING AND ORIENTING APPARATUS

Rolf Haarer, Winterbach; Theo Moser, Steinenberg, and Klaus Reum, Korb, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,039

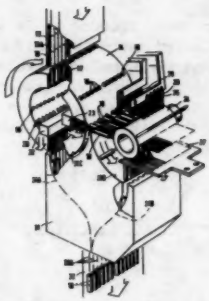
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626733

Int. Cl.[4] B65G 47/24

U.S. Cl. 198—388 **19 Claims**

1. Apparatus for sorting and orienting randomly-disposed elongate containers which are at least partially closed at one end and open at the other end, the apparatus comprising a first rotor rotatable about a first axis, a second rotor rotatable about a second axis parallel to the axis of the first rotor, said first rotor containing radially-disposed bores of uniform cylindrical shape for receiving the containers and said second rotor having radially-disposed spokes, means for rotating said first and second rotors to periodically bring said radially-disposed bores into alignment with said radially-disposed spokes, dispensing means adjacent said first rotor for depositing said randomly-

disposed elongate containers in said radially-disposed bores in said first rotor as said radially-disposed bores are moved into alignment with said dispensing means, means operable when said first and second rotors move to positions wherein said radially disposed bores are aligned with said radially-disposed spokes to eject said containers that are disposed with their open ends facing away from the center of rotation of said first rotor onto said spokes, and friction engaging means for retaining said containers by frictional engagement that are disposed



with their open ends facing toward the center of rotation in said radially-disposed bores, receiving means adjacent said first and second rotors for receiving containers from said first and second rotors, whereby rotation of said first and second rotors align said containers with said receiving means, open end facing the respective axis of said first and second rotors, and means for ejecting said containers from said first and second rotors into said receiving means as said containers are moved into alignment therewith, said containers thereby being aligned in the same orientation.

4,802,569

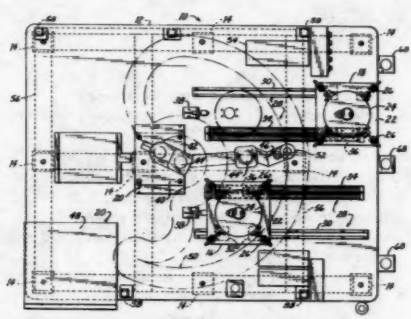
TWO STATION ROBOTIC WELDER

Stephen H. Aidlin, and Russell Bailey, both of Sarasota, Fla., assignors to Aidlin Automation Corp., Sarasota, Fla.

Filed Jun. 12, 1987, Ser. No. 62,170

Int. Cl.[4] B65G *47/00*

U.S. Cl. 198—346.1 **8 Claims**



1. A machine for sequentially performing an operation on a plurality of parts, comprising in combination:

a left and right nest, each comprising a base member;

fixture means affixed to each said base member for securely receiving one of the parts therein;

table means;

a pair of slide means in side by side relationship for slidably connecting said nests to said table means allowing each said nest to individually shuttle back and forth in parallel paths between an extended position at a loading and unloading operator station adjacent to one edge of the machine and a retracted position at a work area within the machine in an alternating sequence;

robotic means including a predefined work footprint including said fully retracted positions of said nests; and

operation means affixed to said robotic means for performing the desired robotic operation on the part mounted within said fixture of a retracted said nest, whereby a part may be loaded into the fixture of one nest while the part previously loaded into the fixture of the other nest may be operated on and then, upon actuation of said rail means, the newly loaded part is shuttled to the retracted position for being operated on while the completed part is shuttled to the extended position for unloading and reloading with a new part.

4,802,570

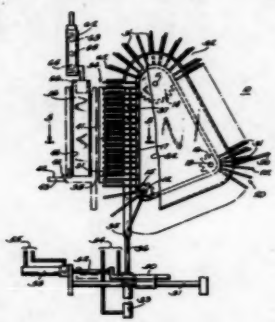
STACKER WITH A YOKE-TYPE STRIPPING DEVICE

John L. Hirsch, Sheboygan Falls, and Mark L. Wingender, Sheboygan, both of Wis., assignors to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Sep. 14, 1987, Ser. No. 95,839

Int. Cl.[4] B65G *61/00*

U.S. Cl. 414—790 **6 Claims**



1. A stripper for stripping articles from a conveyor, the conveyor comprising: driven closed loop flexible means driven lengthwise, a series of paddle members disposed along the length of said flexible means, said paddle members having corresponding ends connected to said flexible means and extending outwardly therefrom for articles to be deposited on said paddle members at one location and for a series of articles to be accumulated on said paddle members, respectively, where a series of generally vertically moving paddle members are above and below each other at another location to facilitate stripping said articles from said paddle members to form a stack of articles, said stripper comprising:

front and rear rows of laterally spaced apart upright stripper bars and carrier bars extending horizontally from one row toward the other to form a yoke, said carrier and stripper bars being spaced from each other to define slots of sufficient width between them for said vertically moving paddle members to pass through so a series of articles can be accumulated on paddle members above said carrier bars,

a fixed horizontal table top adjacent the line of movement of said paddle members, said top having slots directed toward the line of vertical movement of said paddle members, said slots in the table top being aligned with said carrier and stripper bars,

yoke positioning means coupled to said yoke and operative to establish said yoke in a first position in alignment with said generally vertically moving paddle members to accumulate said series of articles between said upright stripper

bars while simultaneously holding said yoke at a level wherein said carrier bars are higher than said horizontal table top,

said positioning means operating further to shift said yoke laterally toward a second position for said upright bars to strip said articles from said paddle members and locate the stack of articles, while being supported on said carrier bars, over said slots in the table and

said positioning means operating further to lower said yoke to a third position horizontally wherein said carrier bars are registered in said plate slots flush with said table.

4,802,571

APPARATUS FOR CONVEYING SUSPENDED BOTTLES

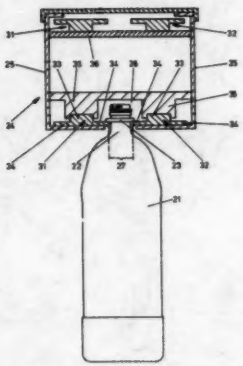
Gerhard Born, Bingen; Paul Elsner, Bad Kreuznach, and Heinz-Jürgen Scherer, Windesheim, all of Fed. Rep. of Germany, assignors to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Apr. 25, 1986, Ser. No. 856,695

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515353

Int. Cl.[4] B65G *15/14*

U.S. Cl. 198—627 **12 Claims**



1. A bottle-conveying apparatus for conveying bottles along a conveying path between as well as within treatment and related bottle-handling stations along the conveying path, with said bottles each having a pronounced distinctly defined annular bead on the neck of the bottle; said apparatus comprising:

a conveyor line, which extends over the conveying path;

means forming a guide slot with the conveyor line;

a bottle carrier means that is provided with the conveyor line and that extends along said conveying path, that extends below the annular bead on the neck of the bottle, and that guides said bottles in a suspended state loosely supported only with friction engagement contact, via said annular beads on the neck of said bottles respectively, with play, through said means forming the guide slot that extends along said conveying path;

said bottle carrier means including a side edge region arranged with said conveyer line for providing said bottles with a feed movement for conveying said bottles and to provide said feed movement parallel to said means forming the guide slot for said bottle necks, with said forming said guide slot being provided on said bottle carrier means;

said bottle carrier means further including a first endless conveyor movable along said guide slot for said bottle necks, at a feed speed that corresponds to the desired conveying speed; said conveyor includes said side edge region, said side edge region deli one side of said guide slot; said apparatus also includes further bottle carrier parts that keep said bottle beads on said side edge region of said conveyor;

said further bottle carrier parts being formed by a second endless conveyor that also includes a side edge region, which is disposed opposite said side edge region of said a first conveyor, with said conveyers being guided parallel to, and at such a distance from, one another that said guide slot for said bottle necks is formed between said opposed side edge regions, with a secure seating for said bottle neck beads being formed on each side of said side edge regions; and

said conveyors being operated at the same feed speed, namely the desired conveying speed for said bottles; each of said conveyers being embodied as a hinged chain that is able to follow a laterally converging curved path, with each of said chains having at least one side edge region, and adjacent thereto a guide region that projects beyond said side edge region.

4,802,572

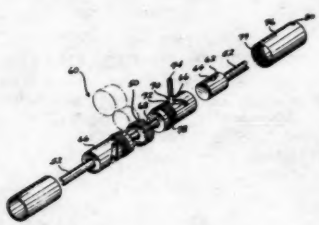
AIRCRAFT CARGO ROLLER SYSTEM

Thomas H. Shorey, Mill Creek, and Mark W. Shorey, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 2, 1987, Ser. No. 115,383

Int. Cl.[4] B65G *13/06*

U.S. Cl. 198—791 **13 Claims**



1. An aircraft cargo roller system, comprising:

one or more rotatable rollers for supporting and moving cargo;

motor means for rotating the rollers; and

at least one rotatable coupler for coupling the motor means to the rollers, the coupler comprising:

a first member coupled to the motor means;

a second member having a longitudinal axis and engageable with the rollers; and

a position control means connecting the first and second members together, the position control means being configured so that upon rotation of the first member by the motor means, the second member, when initially out of engagement with the rollers, will be first moved translationally along its longitudinal axis into engagement with the rollers, and then rotated to thereby rotate the rollers, and upon rotation of the motor means in an opposite direction, the second member will sequentially be first disengaged from the rollers, then engaged with the rollers, and then rotated to thereby rotate the rollers in the opposite direction.

4,802,573

PROCESS FOR WET QUENCHING OF COKE

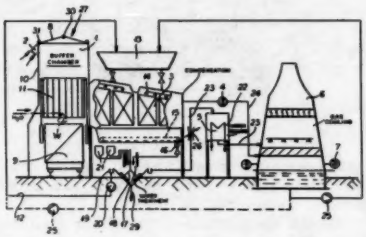
Heinz Hölter; Heinrich Igelbüscher, both of Gladbeck; Heinrich Gresch, Dortmund, and Herlbert Dewert, Gladbeck, all of Fed. Rep. of Germany, assignors to Heinz Holter, Gladbeck, Fed. Rep. of Germany

Filed Feb. 9, 1987, Ser. No. 12,580

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1986, 3603985

Int. Cl.[4] C10B *39/08*

U.S. Cl. 201—39 3 Claims



1. In a process for quenching coke with low smoke/vapor emissions in which glowing coke is sprayed with water and thereby quenched while a quenching smoke/vapor is produced wherein the improvement comprises bunkering said quenching smoke/vapor in a storage chamber before delivery to said atmosphere, intermittently mixing said bunkered smoke/vapor with fresh air to prevent an explosive carbon monoxide concentration from developing in the storage chamber in which said quenching smoke/vapor is bunkered, withdrawing said bunkered smoke/vapor from the storage chamber and spraying the withdrawn smoke/vapor with water to form a condensate and a gas phase, separating the gas phase from the condensate and further cooling the separated gas phase, and wherein the condensate is further cooled and recycled for spraying the withdrawn smoke/vapor.

4,802,574

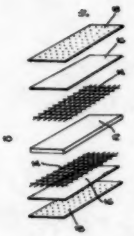
ABSORBENT FOR A GAS PRESERVATIVE ATOMOSPHERE

Yosuke Akiba, 21-11, Sendagaya 1-chome, Shibuya-ku, Tokyo, Japan

Filed Dec. 1, 1987, Ser. No. 127,165

Int. Cl.[4] B65D *81/26, 81/22*

U.S. Cl. 206—204 14 Claims



1. An apparatus for dispersing a gaseous food preservative into a vessel containing food substance comprising:

an absorbent strip comprising at least one absorbent layer having a top and a bottom;

a layer of non-woven fabric in a lattice network placed onto said top and bottom of said absorbent strip forming a non-woven fabric combination having a top and a bottom;

a plastic film placed onto said top and bottom of said non-woven fabric combination forming a plastic film combination having a top and a bottom; and

a plastic cover placed onto said top and bottom of said laminated film combination, said plastic cover being sealed along its edges.

4,802,575

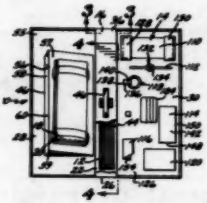
FOOD STORE COUPON ORGANIZER

Dorothy B. Martin, 1205 E. Ocean Blvd., Long Beach, Calif. 90802

Filed May 26, 1987, Ser. No. 54,200

Int. Cl.[4] B65D *85/00*; A45G *11/00*

U.S. Cl. 206—232 3 Claims



1. A coupon organizing system comprising:

a plurality of category pages, each said category page having a first wall, first indicia means extending outwardly from said first wall, and a plurality of substantially vertical overlapping divider walls mounted to said first wall to define a plurality of staggered pockets, said staggered pockets including means for facilitating insertion and withdrawal of coupons therefrom, wherein said means for facilitating insertion and withdrawal of coupons therefrom includes a lip formed in one of said walls;

a carrying case sized to receive said category pages, at least one of said category pages pivotally mounted to said carrying case; and

attaching means for releasably attaching said plurality of category pages to said carrying case.

4,802,576

STORAGE CONTAINER FOR A PAINT ROLLER

Ingo Kern, Witzlebenstrasse 13, D-1000 Berlin 19, Fed. Rep. of Germany

Filed Nov. 26, 1986, Ser. No. 935,327

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3542164

Int. Cl.[4] B65D *43/16, 85/08*

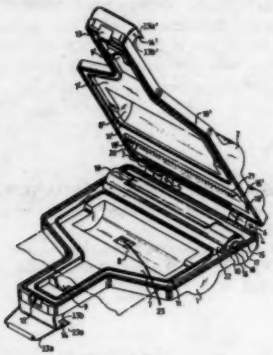
U.S. Cl. 206—225 19 Claims

1. A storage container for a paint roller having a handle and a paint-applying roll, said storage container comprising a housing for receiving and enclosing the paint roller therein and having a recess generally configured to the outline of the roller to receive said paint roller therein, said housing having an inside and an outside, means to provide open and closed positions for said housing, said open position permitting the insertion and removal of the paint roller,

sealing means provided in said container for forming a hermetic seal around the roller when the container is in the closed position; and

foil receiving means in said container generally configured

to the outline of a roll of foil for receiving said roll of foil, said foil receiving means being adjacent said paint-applying roller when said roller is disposed in said container, said foil receiving means defining a further recess.



4,802,577

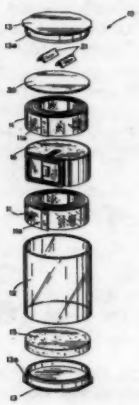
DISPLAY CONTAINER FOR A PLURALITY OF BELTS

Dennis E. O'Leary, 2635 Broadway, Suite 3, Toledo, Ohio 43609

Filed Jul. 1, 1988, Ser. No. 214,303

Int. Cl.[4] B65D *85/18*

U.S. Cl. 206—278 **12 Claims**



1. A display container for a plurality of belts comprising:

a hollow body having upper and lower open ends, said body being formed from a transparent material;

upper and lower end caps for closing said upper and lower open ends of said body; and

central spacer means disposed within said body, said central spacer means being spaced apart from said upper end cap to provide an upper space within said body for at least one belt disposed between said central spacer means and said upper end cap and being spaced apart from said lower end cap to provide a lower space within said body for at least one belt disposed between said central spacer means and said lower end cap.

4,802,578

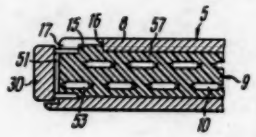
SURGICAL INSTRUMENT

Ernest M. Akopov; Valery E. Schitinin, and Anna V. Arapova, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki, Moscow, U.S.S.R.

Division of Ser. No. 772,733, Sep. 5, 1985, Pat. No. 4,684,051. This application Jun. 24, 1987, Ser. No. 49,210

Int. Cl.[4] B65D *85/24*

U.S. Cl. 206—339 **4 Claims**



1. A detachable staple magazine for a surgical instrument adapted for placing linear staple sturctures, said detachable staple magazine comprising:

a body shaped as a rectangular monolith parallelepiped having a front surface and a rear surface, two side faces and two end faces;

two portions provided integrally with said body so that these portions are adjacent to said two end faces thereof, said two portions each having a front surface and a rear surface which are extensions of said front surface and said rear surface, respectively, of said body, two side faces arranged so that a distance in between said two side faces of said two portions is smaller than a distance in between said two side faces of said body, and an end face arranged to be located on an opposite side with respect to said body; and

a plurality of through slots for staples provided in said body throughout the entire length thereof and in said two portions adjacent to the end faces of said body, said through slots being located in between said front surface and said rear surface of said body and said two portions.

4,802,579

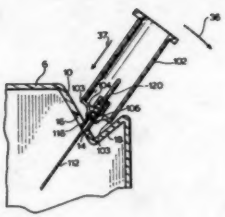
MEDICAL CONTAINER

S. Warren Hall, and Jacquelyn L. O. Hall, both of 3 Cranleigh Court, Islington, Ontario, Canada

Filed Mar. 17, 1987, Ser. No. 26,875

Int. Cl.[4] B65D *83/10*

U.S. Cl. 206—366 **7 Claims**



1. In a container, a disposable medical needle engaging region comprising a notched area having a camming surface and an associated recess in an adjacent angled surface,

said recess having a widened region for allowing entry of a disposable medical needle and a gripping region associated with said widened region sized to engage a plastic connecting piece of such needle when forced into engagement therewith,

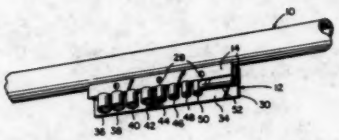
said gripping region being appropriately spaced from said camming surface to cooperate with a support of such needle to effect gripping of such plastic region in said gripping region by using such support as a lever against said camming surface urging such plastic region into said gripping region.

4,802,580

MAGNETIC SOCKET AND TOOL HOLDER

Timm Andersen, 505 W. Pickett Creek Rd., Grants Pass, Oreg. 97527

Filed Dec. 17, 1987, Ser. No. 134,041
Int. Cl.[4] B65D *85/70*; A47F *5/08*; H01F *7/20*
U.S. Cl. 206—378 **8 Claims**



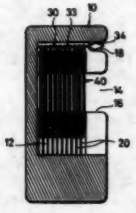
1. A magnetic socket and tool holder including a pair of elongated ferrous material, laterally spaced apart and generally parallel armature plates, a plurality of permanent magnets supported between said plates and spaced longitudinally therealong, said plates including first and second pairs of generally coplanar corresponding opposite side longitudinal edges, said first pair of corresponding edges being abutable against a ferrous object for magnetic support of said holder therefrom and said second pair of corresponding edges defining abutment edges to be abutted and spanned by a plurality of ferrous objects spaced along said plates for removable magnetic support of said objects therefrom, a positioning plate generally paralleling and supported and laterally spaced from one of said armature plates on the side thereof remote from the other armature plate, said positioning plate including one longitudinal marginal portion corresponding to said second pair of corresponding edges and projecting appreciably edgewise outwardly therebeyond, said one longitudinal marginal portion defining a handle as well as an abutment plate portion to be abutted by the opposing surfaces of said ferrous objects for proper alignment of said objects along said second pair of corresponding plate edges.

4,802,581

NEEDLE CASE

Masamitsu Takahashi, Hiroshima, Japan, assignor to Bankoku Needle Manufacturing Co., Ltd., Hiroshima, Japan

Filed Mar. 14, 1988, Ser. No. 167,842
Claims priority, application Japan, Apr. 24, 1987, 62-62154[U]; Jan. 16, 1988, 63-4000[U]
Int. Cl.[4] B65D *85/24*
U.S. Cl. 206—380 **2 Claims**



1. A needle case comprising:

a case member having an accommodation portion capable of accommodating a plurality of needles therein, a notch portion where any of the shanks of the needles can be pinched, a takeout opening from which a needle is extracted, and a cutaway portion through which thread is passed; and

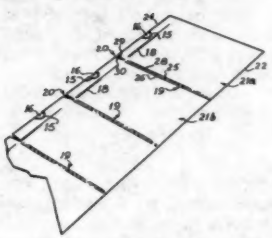
a needle supporting member formed of elastic metal or resin into a forked elongate member having a forked portion fixed to a portion of said case member at a position opposite to the position of said takeout opening of said case member, an extension portion extending in a direction in which a needle is extracted and passing through the eyes of the needles to support the needles in a suspended state within said accommodation of said case member, and an expansion portion disposed at a position corresponding to the position of said cutaway portion of said case member, having a hole of a diameter substantially the same as the width of said cutaway portion of said case member and large enough to easily pass thread therethrough, and capable of preventing the needles from passing therethrough due to an elastic force of the material thereof in an expanding direction thereof under normal conditions but permitting a needle to pass therethrough against the elastic force when a force for extracting the needle from said takeout opening of said case member is exerted on the needle.

4,802,582

CONTINUOUS DRAW TAPE BAGS

James R. Johnson, Doraville, Ga., assignor to AMI, Inc., Doraville, Ga.

Continuation-in-part of Ser. No. 47,677, May 8, 1987, which is a continuation-in-part of Ser. No. 829,808, May 12, 1987, Pat. No. 4,664,649. This application Oct. 27, 1987, Ser. No. 114,093
Int. Cl.[4] B65D *33/28*
U.S. Cl. 206—390 **8 Claims**



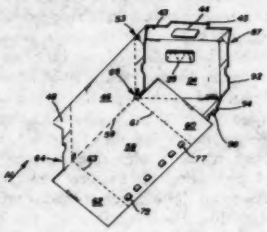
1. A plurality of draw tape bags defined along a web of bag material, each bag of said plurality of bags having opposed parallel side walls, a lower edge of said side walls joining said opposed side walls, and upper hemmed edges parallel to said lower edge and including a hem in each of said side walls and a draw tape within each of said hems, said web of bag material including a plurality of side seals generally perpendicular to said lower edge, said plurality of side seals being so arranged that two side seals are adjacent to each other between adjacent bags along said web of bag material, said web defining a line of perforations between said two side seals adjacent to each other, and a plurality of side welds extending generally through said hems.

4,802,583

ARTICLE CONTAINER WITH OVERWRAP

Rodney K. Calvert, Dunwoody, and Prentice J. Wood, Hapeville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 11, 1988, Ser. No. 167,094
Int. Cl.[4] B65D 75/28, 17/28
U.S. Cl. 206—427 8 Claims



1. An article container comprising a reusable case having a rectangular bottom wall, a pair of side walls joined respectively to opposite side edges of said bottom wall and projecting upwardly therefrom, and a pair of end walls joined respectively to opposite end edges of said bottom wall and respectively joined at their end edges to adjacent end edges of said side walls to form an open top structure, and a disposable overwrap having a rectangular main panel overlying said case, a pair of rectangular side panels foldably joined respectively to opposite side edges of said main panel and projecting downwardly in overlying relation respectively to said side walls, a pair of upper end panels foldably joined respectively to opposite end edges of said main panel and projecting downwardly in overlying relation respectively with said end walls, collapsible web structure interconnecting each end edge of each of said upper end panels with the adjacent end edge of each of said side panels, a rectangular bottom panel foldably joined to the bottom edge of one of said side panels and underlying said bottom wall, a pair of lower end panels foldably joined respectively to opposite ends of said bottom panel and projecting upwardly, in overlying, relation with said end walls and in face contacting relation with the lower portions of said upper end panels respectively and secured thereto, collapsible web structure interconnecting one end edge of each of said lower end panels with the adjacent end edge of one of said side panels, an end flap foldably joined to each end edge of the other of said side panels and secured to the inner surface of the adjacent one of said lower end panels, and means adjoining said bottom panel to the lower part of said other side panel.

4,802,584

KIT FOR PREPARING BLISTER PACKAGES

John A. Harrison, Hudson, Wis.; Gary A. Isakson, Woodbury, Minn., and James R. Nelson, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 18, 1988, Ser. No. 156,985
Int. Cl.[4] B65D 85/00
U.S. Cl. 206—447 3 Claims

1. A pad comprising a plurality of sheets of similar size and shape, each of said sheets having a backing having on one major surface thereof a layer of a first adhesive, said sheet being laminated to a release layer, said first adhesive layer being in face-to-face contact with said release layer, each of said sheets being attached to a like sheet by means of a first bonding strip having a backing having on one major surface thereof a layer of a second adhesive and on the other major surface thereof a layer of a low adhesion backsize, said first bonding strip being coextensive with at least one edge of said sheets, a portion of said second adhesive layer being bonded to a portion of said release layer, the remainder of said second

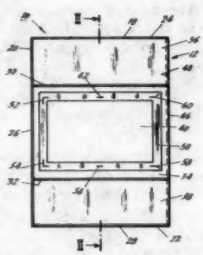
adhesive layer being bonded to a portion of said layer of said low adhesion backsize of a second bonding strip.

4,802,585

PICTURE HOLDER

Rudolph Durrer; Hilmar Priessner, both of Zürich, and Eric Bach, Taufkirchen, all of Fed. Rep. of Germany, assignors to Peter Fuchs GmbH Druckservice, Fed. Rep. of Germany

Filed Jul. 22, 1986, Ser. No. 888,749
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1985, 8521119
Int. Cl.[4] B65D 85/48
U.S. Cl. 206—449 5 Claims



1. A holder for pictures, or the like, comprising:

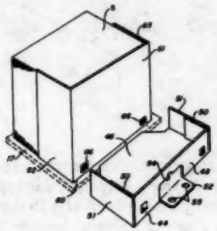
two generally rectangular layers of a transparent plastic material welded together at three of four outer edges to form an envelope open at one of the edges; at least on further weld seam between the layers and extending parallel to one of the edges intersecting the open edge for dividing the envelope internally, into a plurality of pockets; guide means in one of the pockets, comprising guide means weld seams between the two layers, said guide means weld seams being shorter in length than the distance between the open edge and the opposite closed edge of the one pocket, said guide means weld seams being placed at positions within said pocket for guiding installation of a picture, or the like, through the one open edge and into a predetermined region of the one pocket defined by the guide means weld seams.

4,802,586

HIGH SPEED DUPLICATOR WITH COPY SHEET PREPACKAGED SHIPPING AND LOADING CARTON

Clifford L. George, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 27, 1984, Ser. No. 654,705
Int. Cl.[4] B65D *83/00*
U.S. Cl. 206—556 6 Claims



1. A disposable carton in combination with a stack of sheets adapted for shipping and storage, and for permitting an operator to present a large stack of sheets for use in a printing machine having a sheet feeding apparatus and a sheet supply platform for supporting copy sheets, comprising,

a receptacle having a bottom panel and at least three side panels hingedly connected to said bottom panel along fold lines for supporting the stack of copy sheets therein, said receptacle being open at its top side,

a cover section adapted to cover said receptacle and having a top panel bridging substantially across the open top side thereof immediately above the stack of sheets, said cover section having a main section including said top panel and an edge section adapted to be removed during preparation of the carton for loading in the printing machine,

said receptacle being adapted to be lifted away and removed from said main section to expose the stack of sheets when the receptacle, the stack, and the main section are inverted, said main section being adapted to be manually positioned upon the platform when the same with the stack have been inverted to place said top panel with the stack supported thereon on top of the platform and with the top of the stack in operating association with the sheet feeding apparatus, and

means for permitting the operator to slideably remove said top panel of said main section relative to the platform and the stack and thereby effect the placement of the stack of sheets upon the sheet supply platform.

6. A disposable carton in combination with a stack of sheets adapted for shipping and storage, and for permitting an operator to present a large stack of sheets for use in a printing machine having a sheet feeding apparatus and a sheet supply platform for supporting copy sheets, comprising,

a receptacle having a bottom panel and at least three side panels hingedly connected to said bottom panel along fold lines for supporting the stack of copy sheets therein, said receptacle being open at its top side,

a cover section adapted to cover said receptacle and having a top panel bridging substantially across the open top side thereof immediately above the stack of sheets, said cover section having a main section including said top panel and an edge section adapted to be removed during preparation of the carton for loading in the printing machine,

said receptacle being adapted to be lifted away and removed from said main section to expose the stack of sheets when the receptacle, the stack, and the main section are inverted, said main section being adapted to be manually positioned upon the platform when the same with the stack have been inverted to place said top panel with the stack supported thereon on top of the platform and with the top of the stack in operating association with the sheet feeding apparatus, and

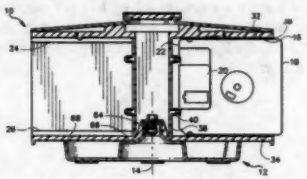
means for permitting the operator to slideably remove said top panel of said main section relative to the platform and the stack and thereby effect the placement of the stack of sheets upon the sheet supply platform, said manually operable means is planar and is adapted to be folded within the same plane as said top panel.

4,802,587

DATA DISKETTE CARTRIDGE STORAGE TRAY WITH RESILIENT BUMPERS

Richard L. Armijo, 5511 Taft Ave., La Jolla, Calif. 92037, and Paul R. Coughlin, 18975 Shadow Wood Dr., Monument, Colo. 80132, assignors to Richard L. Armijo, La Jolla, Calif. and Paul R. Coughlin, Madisonville, Ky.

Filed Jun. 12, 1987, Ser. No. 62,434
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—444 2 Claims



1. A tray for storing data diskette cartridges, each of which cartridges is flat, made of rigid material, and includes a shutter which covers a portion of one edge of the diskette cartridge, with the shutter being spring-biased to cover an aperture in the cartridge that exposes a data diskette in the cartridge to a transducer when the cartridge is inserted into a data retrieval device to thereby move the shutter, said tray comprising

a chassis defining an open chamber having first and second opposed walls and slots in the first and second opposed walls for receiving opposite edges of individual diskette cartridges inserted into the chamber, and further defining a back wall at the opposite end of the chamber from the opening;

wherein the back wall includes a bumper positioned for contacting a portion of the partially shuttered edge of the data diskette cartridge not covered by the shutter when the shutter is in its spring-biased position and when the cartridge is inserted into the chamber with the shutter facing the back wall, to thereby prevent the shutter from contacting the back wall when it is inserted into the chamber;

wherein the bumper comprises

resilient material for forcing a said cartridge positioned at rest in contact with the bumper away from the bumper in response to the cartridge momentarily being forced into the bumper from its at-rest position; and

a rigid ridge extending from the back wall of the chamber;

wherein said resilient material is secured to the ridge, and extended from the ridge to define a void between the ridge and the portion of the resilient material contacted by the cartridge.

4,802,588

PLANT GROW AND TRANSPORT PALLET

Aarre Silvola, 2910 Rainbow Glen Rd., Fallbrook, Calif. 92028

Filed Apr. 18, 1984, Ser. No. 601,503
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—511 5 Claims

1. A stackable open top pallet for supporting and transporting plants, comprising:

an open rectangular frame defined by opposed parallel side rails and a pair of opposite end rails;

a plurality of pairs of tray support cross members secured between opposite sides of said frame for supporting a plurality of growing trays;

a pair of fork engaging cross members secured to and beneath a pair of said tray support cross members;

a support flange extending inwardly from said end rails and across each end of said frame; and

vertically extending support means defined by said end rails extending downwardly from the ends of said frame for engaging the support flange of a lower pallet for support thereof, said support means having sufficient height to enable stacking a plurality of pallets for accommodating predetermined growth of seedlings and for transporting stacks of pallets loaded with seedlings without damaging the seedlings.

4,802,589

HOUSING FOR ELECTROTECHNICAL EQUIPMENT

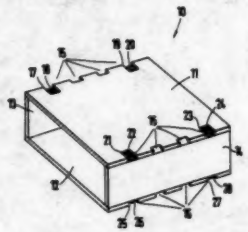
Franco Berg, Isernhagen, and Claus-Dieter Bovermann, Breidenbach-Niederdieten, both of Fed. Rep. of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 29, 1987, Ser. No. 102,035

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633248

Int. Cl.[4] B65D *85/62*

U.S. Cl. 206—511 **19 Claims**



1. Housing for electrotechnical equipment comprising two side walls, a top wall and a bottom wall, said walls forming a framework having two generally rectangular openings which are sealable by means of a back wall, a door, or an inspection window, and wherein stacking legs are pivotally mounted near the edges of the housing at the corners of said top and bottom walls and said stacking legs are adjustable between a retracted position in which they are substantially flush with said top and bottom walls and an extended position in which they are substantially perpendicular to said top wall and said bottom wall, characterized in that at least said stacking legs mounted at said bottom wall comprise terminal stacking ends, and at least said stacking legs mounted at said top wall form stacking seats in which said terminal stacking ends of said stacking legs in the extended position, are insertable when said stacking legs are in said retracted position.

4,802,590

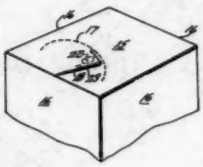
MILK CARTON WITH FOLDED SPOUT

Barry W. Smith, 535 Plum Ave., Sutherlin, Oreg. 97479

Filed Oct. 25, 1987, Ser. No. 112,405

Int. Cl.[4] B65D *5/70*

U.S. Cl. 206—620 **2 Claims**



1. In a liquid storage carton of fibrous material and having contiguous side walls and a perpendicular top wall, the improvement comprising a spout integral with the top wall of the carton and having a pair of primary members jointed along a fold line, said fold line intersecting a carton edge intermediate extremities of said edge, a pair of secondary members integral with said primary members and with said top wall, said spout when collapsed lying in parallel relationship with the carton top wall, a line of severance extending horizontally in said top wall and terminating in said top wall at points offset from said carton edge, said line of serverance denoting the extremities of said secondary members, said primary members folded against one another and overlying one of said secondary members, said primary members of the spout additionally serving as a finger grip during deployment of the spout from the carton top wall with separation of said secondary members from the top wall occurring along said line of severance.

4,802,591

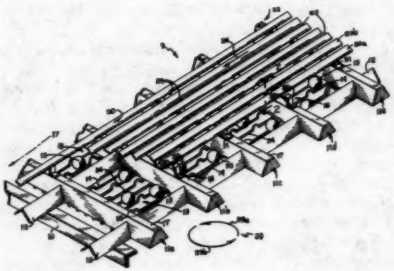
LOUVERED CHIP SCREENER

William E. Lower; W. Nash McCauley, both of Cincinnati; Stephen C. Mitchell, Westchester; Roger C. Robins, Reading, and Steven A. Schmidt, Cincinnati, all of Ohio, assignors to Rotex, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 901,885, Aug. 29, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 167,690

Int. Cl.[4] B07B *13/04, 1/28*

U.S. Cl. 209—680 **29 Claims**



1. A machine for separating chips according to thickness, comprising,

a frame mounting a sloping deck on which chips flow generally downwardly from an upper end toward a discharge end, the deck comprising a series of spaced parallel slats mounted on slat support means which are spaced apart along the length of the slats, the slats extending parallel to the downward direction of chip flow, the support means

canting each slat transversely to the general plane of the deck,

the slats presenting elongated openings between them, said openings being parallel to the slats and extending the length of the deck and through the discharge end thereof;

a drive for imparting a screening motion to said frame;

said drive moving the deck in a horizontal rotary path wherein during the upstream half of the cycle said openings are moving transversely toward chips on adjacent slats facing the respective openings, and away from such chips during the downstream half;

the slat support means of adjacent slats being staggered with respect to one another, each slat being deflectable along its length between the slat support means which support it, adjacent slats thus being deflectable relative to one another along their entire length; and

ball cleaning means having narrow, elongated ball support members which extend parallel to said slats.

4,802,592

FLOATING LIQUID SKIMMERS HAVING A FLOATING WEIR

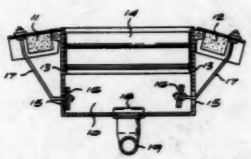
Allistair P. Wessels, Bryanston, South Africa, assignor to Fabet NV, Curacao, Netherlands Antilles

Filed Feb. 16, 1988, Ser. No. 156,365

Claims priority, application South Africa, Feb. 17, 1987, 87/1137

Int. Cl.[4] E04H 3/20

U.S. Cl. 210—169 **6 Claims**



1. A floating skimmer which comprises a body, a floating weir at an edge of the body over which liquid can pass into the body, a suction outlet in the base of the body for connection to a suction hose, at least one float for keeping the body buoyant and which is hinged to the body, a scuttle valve in a wall of the body, and motion transmitting means between the float and the scuttle valve so that as the float pivots downwardly when the body rises in liquid, the scuttle valve is opened to allow liquid to enter the body and cause it to float at its original level.

4,802,593

FLEXIBLE DESKTOP ORGANIZER

Nayla J. Romanos, 4201 Cathedral Ave., N.W. Apt. 819 E, Washington, D.C. 20016

Filed Jul. 14, 1987, Ser. No. 73,232

Int. Cl.[4] B42F 17/00

U.S. Cl. 211—10 **6 Claims**

1. As an article of manufacture, a desktop organizer comprising, in combination:

a gridded planar base having a plurality of openings therein;

said openings being of substantially the same configuration and comprising substantially the same shape;

a plurality of functional modules capable of being located in various positions on said base;

said modules containing one or more protrusions on the bottom portions thereof;

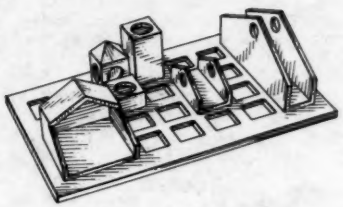
said protrusions being of substantially the same configuration as said openings, but being adapted so as to fit within one or more of said openings in said gridded base;

said protrusions being of sufficient length in a vertical plane to effectively hold said modules in desired locations on said base; and

said modules being adapted to function as containers for a variety of desk implements or serving other office functions, said plurality of functional modules comprising one or more of

(a) a series of cross-sectionally square-shape modules formed of four sidewalls having the same surface area, a bottom portion containing said protrusion, and a top portion having an opening therein, each of said modules being adapted to have a hollow inside portion and to function as a container for various desk accessories based on the height of said modules;

(b) a module adapted to function as a paperweight by forming a solid square-shaped block having a pyramid-shaped top portion and a bottom portion containing said protrusion;



(c) a series of modules adapted to hold business cards, envelopes, documents or similar desk accessories comprising a bottom portion containing at least two of said protrusions, and two similarly-shaped sidewalls rising vertically from opposite peripheral edges of said bottom portion to form a holding space therebetween; and

(d) a series of modules adapted to form a partially enclosed holding section comprising a bottom portion containing four of said protrusions, three sidewalls and a top portion comprising two similarly-shaped roof pieces adapted to form an upwardly inclined roof-like structure, each of the sidewalls and roof pieces being shaped to integrally form said partially enclosed holding section for holding memo pads, cigarettes or other desk accessories, and said modules may further comprise a piece adapted to form a shelf parallel with said bottom portion and extended between two opposing sidewalls below said upwardly inclined roof like structure.

4,802,594

BICYCLE SUPPORT STAND

John W. Graber, Stoughton, Wis., assignor to Graber Products, Inc., Madison, Wis.

Filed Jan. 22, 1988, Ser. No. 146,852

Int. Cl.[4] A47F 7/04

U.S. Cl. 211—20 **6 Claims**

1. A bicycle support stand comprising, a generally horizontal base frame including first and second cross frame members and first and second longitudinal frame members, the longitudinal frame members each having a first end portion attached

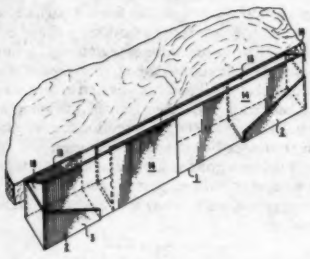
to the first cross frame member and a second end portion attached to the second cross frame member and extending in generally parallel spaced relation between the cross frame members to straddle a bicycle tire, a first crotch frame including first and second leg portions having lower ends attached to the first end portions of the first and second longitudinal frame members respectively, the first and second leg portions of the first crotch frame extending upwardly from the first end portions of the respective first and second longitudinal frame members and having upper ends connected by a first U-shaped crotch portion extending transverse to the associated leg portions, a second crotch frame including first and second leg portions having lower ends attached to the second end portions of the first and second longitudinal frame members respectively, the first and second leg portions of the second crotch frame extending upwardly from the second end portions of a respective first and second longitudinal frame members and having upper ends connected by a second U-shaped crotch portion extending transverse to the associated leg portions, the first and second crotch portions having open sides in opposed relation to straddle a bicycle tire at first and second locations spaced from each other and from the longitudinal frame members, the first and second longitudinal frame members being attached to the cross frame members for adjustment relative to each other to accommodate bicycle tires of different size.

4,802,595

DEBRIS RECEIVING TROUGH

Bengie Northington, 14643 Almanac Dr., Burtonsville, Md. 20866

Filed Sep. 4, 1987, Ser. No. 93,224
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—88 **8 Claims**



1. A trough, means for attaching the trough to and supporting it from edge of a drafting table and means for extending the length of the trough comprising interfitting channel members, a rib formed integrally with the bottom of one said channel member and a grove on another of said members slidably receiving said rib whereby the channel members may be moved relative to each other to vary the overall length of the trough and the rib and groove guide their relative motion, reinforce the members and lend lateral stability to the trough.

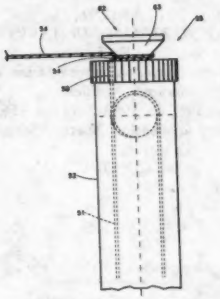
4,802,596

CLOTHES DRYING APPARATUS

Walter Steiner, Säntisstrasse 52, CH-8311 Brütten, Switzerland

Filed Nov. 12, 1986, Ser. No. 929,992
Claims priority, application European Pat. Off., Nov. 16, 1985, 85114578.9; Switzerland, Jan. 16, 1986, 163/86
Int. Cl.[4] A47B *47/00*
U.S. Cl. 211—197 **5 Claims**

1. A clothes drying apparatus comprising:
a central, elongate supporting post member;
a plurality of support arms for supporting a plurality of first clothes line portions extending between said support arms;
a collar member mounted on said supporting post member for supporting said support arms, said support arms having one end pivotally attached to said collar member, said collar member being axially displaceable along said supporting post member between upper and lower positions in which said support arms are, respectively, in an extended position in which said support arms are spread out so that the first clothes line portions extend between said support arms in an essentially stretched condition, and a rest position in which said support arms are essentially parallel to said supporting post member;
a head member mounted on the top portion of said supporting post member;
a plurality of strut members having one end thereof pivotally connected to said head member and the other end thereof pivotally connected to respective support arms;
a second clothes line portion extendable between said head member and an anchoring member distantly located from said supporting post member;



storage means for storing said second clothes line portion adjacent said supporting post member;
means for retracting said second clothes line portion onto said storage means;
means for locking a section of said second clothes line portion in the vicinity of said head member when in an extended position between said head member and the anchoring member;
said head member comprising an eccentric opening through which said second clothes line portion is withdrawn, and said locking means including an extension member centrically mounted on the upper surface of said head member, said extension member having a concial portion which is tapered with a decreasing diameter as it extends toward said upper surface of said head member;
said head member being rotatably mounted on the top of said supporting post member to tension the second clothes line portion when the second clothes line portion is in said extended position.

4,802,597

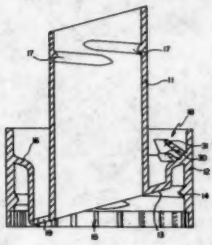
PLASTIC STOPPER FOR A CONTAINER, WITH A MEASURING CUP THAT SERVES AS A CAP

Werner F. Dubach, Maur, Switzerland, assignor to Alfatechnic AG, Dielikon, Switzerland

Filed Jan. 11, 1988, Ser. No. 142,864
Claims priority, application Switzerland, Jan. 22, 1987, 223/87
Int. Cl.[4] B65D *51/24*
U.S. Cl. 215—307 **11 Claims**

1. A plastic stopper for a container used for free-flowing media, having a lower portion (1) that can be secured to a container and having a tubular protruding pouring spout (11), a wall (12) surrounding said spout and an intermediate wall (13) therebetween, said wall (12) and intermediate wall (13) forming an annular trough (18) about the pouring spout (11),

said trough having a drain (19) for returning the medium to the container, as well as a measuring cup (2) that serves as a cap, said measuring cup having an annular inner wall (23) that fits said pouring spout, said inner wall and said spout being provided with coacting attachment means (17,24) the intermediate wall (13) of said annular trough being raised around its periph-



ery to form an annular shoulder (16) that is inclined towards said spout (11), the lower end of the outer wall (22) of said measuring cup being formed as a sharp edged tapered lip (28), said tapered lip capable of lying on said raised inclined shoulder, when said measuring cup is held on said spout by said attachment means, for forming a sealed closure between said measuring cup and said lower portion.

4,802,598

CLOSING FOR A DISCHARGE-PROOF CRYOCONTAINER

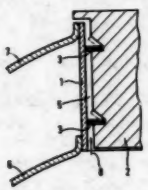
Werner K. Diehl, Cologne; Heinrich Fieseler, Dormagen, and Gerhard SaBmann, Siegen, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Apr. 29, 1988, Ser. No. 188,320

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717053

Int. Cl.[4] B65D *53/06*

U.S. Cl. 215—348 **3 Claims**



1. In a closing for a discharge-proof cryocontainer with a locking stopper which can be inserted in the container neck while forming a gas escape gap, the improvement being in that said gas escape gap is filled at least in part over the entire circumference with polyamide foam.

4,802,599

ENGINE OIL COLLECTOR SYSTEM

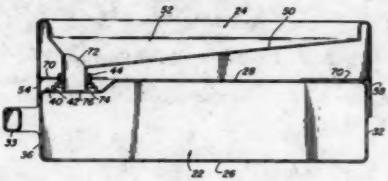
Fred C. Hill, 585 Moyer Rd., Souderton, Pa. 18964

Filed Jul. 15, 1987, Ser. No. 73,559

Int. Cl.[4] B65B *39/00*; F16N *31/00*; B65D *81/36*

U.S. Cl. 220—1 C **7 Claims**

1. A reusable system for collecting used oil from an engine comprising collector means, oil directing means, and sealing means, said collector means comprising an enclosed hollow collector vessel of a predetermined shape and having a bottom wall upon which said vessel is arranged to be disposed beneath said engine, a top wall disposed opposite said bottom wall and having a sealable entrance mouth therein, and at least one side wall interconnecting the top wall and the bottom wall, said oil directing means comprising a drain pan with a lowest point and including a top wall forming a downward sloping recess having an outlet adjacent its lowest point, said drain pan being arranged to be releasably mounted upon said collector vessel during oil drainage, whereupon its outlet is in communication with the entrance mouth to said collector vessel so that oil emptied into said drain pan flows down the recess thereof, through said outlet and said communicating entrance mouth into said vessel, said sealing means comprising a sealing cap to seal said entrance mouth after the oil is located within said collector vessel and said drain pan has been removed therefrom, and said collector vessel may be transported to a disposal



location, said top and bottom walls of said collector vessel each being generally planar, with said collector vessel top wall having a recess therein from which an annular neck projects upward to an elevation just slightly higher than said collector vessel top wall, said annular neck forming said entrance mouth and having helical threads disposed thereabout, said cap including threads for mating with said threads on said entrance mouth, said recess allowing said annular neck to be of sufficient length for said outlet to nest securely within said annular neck to provide stability when said drain pan is mounted on said collector vessel and said recess providing that only a small portion of said annular neck protected by said cap projects beyond said top wall of said collector vessel when said collector vessel is transported to a disposal location.

4,802,600

FREIGHT CONTAINER FOR AIR TRANSPORT

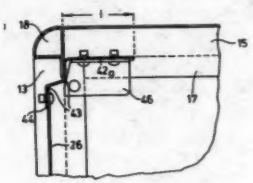
Gerd Bretschneider, Hilzingen, and Dieter Kiesewetter, Radolfzell, both of Fed. Rep. of Germany, assignors to Swiss Aluminum, Chippis, Switzerland

Filed Nov. 25, 1987, Ser. No. 125,479

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 8632203[U]; Apr. 14, 1987, 3712695

Int. Cl.[4] B65D *88/52*

U.S. Cl. 220—1.5 **8 Claims**



1. Freight container for air transport which comprises a baseplate, support frame arranged on the baseplate, said support frame having sections rising from the baseplate and transverse sections connecting the rising sections for a container roof sheeting which at least partially fills in the support frame, one side of the freight container being provided with a lateral loading opening, a gap immediately adjoining the lateral loading opening in the container roof, and a pivotable or displaceable portion of the container roof operative to close said gap

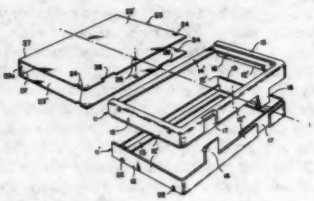
formed by a fold-back cover which is articulated approximately at the center axis (M) of the container roof, including a hollow section adjacent said pivotable portion, wherein the fold-back cover together with the hollow section forms one edge of the container roof and a connecting section on each side of the gap in the container roof for providing transverse reinforcement, each said connecting section being at a right angle to the loading opening underneath the pivotal portion and being fixed at both ends to the support frame, and each said connecting section having a molded extension overlapping adjacent sheeting and being fixed to an outer surface thereof.

4,802,601

HOUSING

Stefan Pijanowski, Peterborough; Peter Thompson, Bourne End, and Adrian Dartnall, Loughborough, all of United Kingdom, assignors to Amaray International Ltd., Buckinghamshire, England

Filed Jan. 27, 1987, Ser. No. 7,698
Int. Cl.[4] B65D *6/00*
U.S. Cl. 220—4 R **6 Claims**



1. A housing comprising spaced-apart front and rear walls and side walls defining a receiving space for the container contents, characterized by the feature that one or more molded, peripheral frame means form a side walls or walls or part side walls of the container and define spaces in which a front wall and a rear wall of the container are locatable when received by receiving means of the frame means; and that one or more initially flat sheets of flexible material are adapted to form the front and rear walls of the container; each said frame means having two spaced or at least one receiving means to receive portions or a portion of said sheet forming the front and rear walls, wherein two frame members are provided as the frame means, with each frame member having receiving means in the form of grooves or channel means with sheet engaging means for retainably receiving one of said flexible sheets or a portion of a flexible sheet which has another portion received by the other frame member.

4,802,602

INSULATING DEVICE FOR A BEVERAGE CONTAINER

John C. Evans, North Webster; Charles E. Campbell, Warsaw, and John E. Blair, North Webster, all of Ind., assignors to Kover-up, Inc., North Webster, Ind.

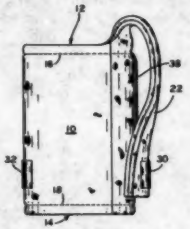
Filed Dec. 8, 1987, Ser. No. 130,071
Int. Cl.[4] B65D *23/08*
U.S. Cl. 220—85 H **8 Claims**

1. A device for insulating a beverage container comprising:

a flexible insulating sleeve adapted to receive a beverage container therein;

a flexible cover for covering one end aperture of said sleeve, said cover having one end thereof secured to said sleeve;

first fastening means operatively associated with said sleeve and the other end of said cover whereby said cover may be secured over said first aperture; and



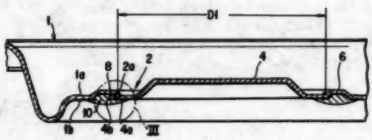
second fastening means operatively associated with said sleeve and the other end of said cover whereby said cover may be secured to said sleeve to form a handle.

4,802,603

EASY OPEN CAN END

Gunter H. R. Schmidt; Hans-Dieter Joge; Wilhelm R. Sauer, all of Neuwied, Fed. Rep. of Germany, and Abraham C. Spruit, Beverwijk, Netherlands, assignors to The Broken Hill Proprietary Company Limited, Victoria, Australia

Filed Nov. 16, 1987, Ser. No. 121,640
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1986, 3639426
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—268 **26 Claims**



1. A can end made from metal for cans whose contents is under inside pressure, specifically for cans to be filled with carbonated beverages, with at least one opening tab partly punched from the end leaving a hinge area, and an aperture belonging to it formed by the partial punching, with the opening tab and/or the area of the end surrounding the aperture being cold formed so that the edge area of the aperture overlaps the edge area of the opening tab on the outside of the end, and with plastisol as a sealant being applied in ring-form to the edge areas of the opening tab and of the aperture on the end inside and having jellied under heat; characterized by the plastisol (10) having a viscosity of $\eta_{D4412}-1$ (40° C.) of about 2000–2800 mPa.s and an edge angle α of about 30°–40° before application and gelation respectively and, after gelation, having a tensile strength of 0.4–1.0 N/mm^2 and a maximum elongation of 120–250%.

4,802,604

MODULE BUILDER BACK DOOR LATCH

Russell E. Lindsey, Lubbock, Tex., assignor to Scott Manufacturing, Inc., Lubbock, Tex.

Filed Feb. 24, 1988, Ser. No. 159,788
Int. Cl.[4] B65D *43/16*; E05C *3/30*
U.S. Cl. 220—324 **3 Claims**

1. In a cotton module builder having:

a. a rectangular top frame,

b. side panels sloping outward from the top frame, and

c. a back door having an outer surface hinged at its top to the top frame, and sloping outward;

Wherein the Improvement Comprises

d. a horizontal latch shaft having two ends journaled to the lower outer surface of door,

e. a lug on the shaft,

f. a crank on each end of the shaft,

g. a latch bolt on each of the cranks,

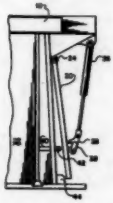
h. a catch on the rear of each of the side panels,

i. so arranged and constructed that when the door is closed rotation of the shaft will cause each of the latch bolts to engage the catches and securely latch the door closed, and

j. a hydraulic cylinder interconnecting the top frame and the lug on the latch shaft

k. so arranged and constructed that contraction of the cylinder will first rotate the shaft to unlatch the door and continued contraction will raise the door, and

l. expansion of the cylinder will permit gravity to close the



door and continued expansion will rotate the shaft to latch the door as set out above.

3. The process involving a module builder having

a. a rectangular top frame,

b. sides sloping outward from the top frame, and

c. a back door having an outer surface hinged at its top to the top frame and sloping outward;

Wherein the Improved Method Comprises:

d. extending a hydraulic cylinder from the top frame to a latch operator on the outer surface of the lower half of the door,

e. operating the latch to unlatch the door responsive to

f. contracting the cylinder,

g. raising the door by further

h. contracting the cylinder after the door is unlatched, then

i. permitting gravity to close the door by expanding the cylinder, and

j. latching the door by

k. further expanding the cylinder after the door is closed.

4,802,605

HINGE FOR CABLE ROUTING

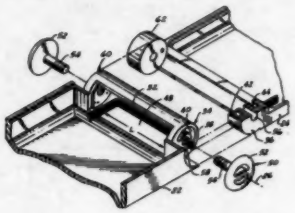
Michael E. Salmon, Flint, and John E. Nemazi, Troy, both of Mich., assignors to GMI Engineering & Management Institute, Flint, Mich.

Filed Apr. 2, 1987, Ser. No. 34,068
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—338 **20 Claims**

1. A hinge for pivotably connecting a first and second housing, to allow limited relative rotation therebetween along a hinge axis while providing an internal routing for a cable or the like therebetween, said hinge comprising:

a first pivot member affixed to the first housing said pivot member having a seal surface, generally concentric with the hinge axis and circumaxial slot formed in the pivot member sealing suface and extending partially about said hinge axis projecting through the pivot member into the first housing;

a second pivot member affixed to the second housing having a sealing surface for engaging the first pivot member sealing surface, said second pivot member having a port formed therein aligned with the circumaxial slot and extending into the second housing providing an internal routing for a cable between the first and second housings; and



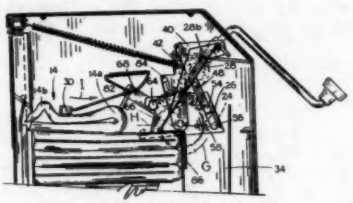
attachment means to attach the first and second pivot members in axial alignment and allowing limited pivotable motion therebetween.

4,802,606

NEWSPAPER DISPENSER

Duane D. Daniels, P.O. Box 67, Ainsworth, Nebr. 69210

Filed Nov. 12, 1987, Ser. No. 119,820
Int. Cl.[4] B65G *59/02*; G07F *11/22*
U.S. Cl. 221—39 **12 Claims**



1. A newspaper dispenser for dispensing a single newspaper at at time, comprising:

an enclosed frame having a platform therein adapted to support a vertical stack of newspapers laid flat thereon, said newspaper having a folded edge and said platform having forward and rearward edges,

said newspaper being stacked with their folded edge aligned above the forward edge of said platform,

a stop means connected to said frame above said platform and located over the forward edge of said platform to hold the folded edge of said papers,

biasing means for biasing said stack of newspapers upwardly against said stop means;

pusher means for pushing the top paper toward the rearwardly edge of said platform;

an operable means for lifting the top newspaper upwardly off of said stack after release from said stop means;

a rotatable handle for operating said operable lifting means, and causing said lift means to slide under the top newspaper in the stack,

a newspaper dispensing chute mounted between said lift means and an opening in the front wall of said frame, for dispensing a paper from said lift means to the front wall opening; and

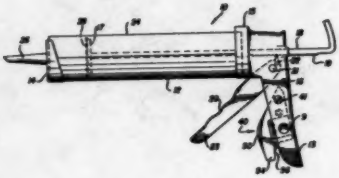
said operable lifting means being pivotal to cause said lifted newspaper to slide off said lifting means and drop down said chute.

4,802,607

TIP TRIMMER ASSEMBLY FOR A CAULKING GUN

Raymond A. Johnson, P.O. Box, Carpinteria, Calif. 93013

Filed Jan. 20, 1988, Ser. No. 146,079
Int. Cl.[4] B67B 7/54
U.S. Cl. 222—82 11 Claims



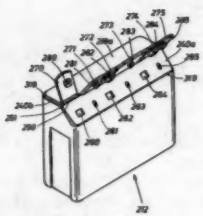
1. A caulking tube tip trimmer assembly adapted for use between a manually actuated caulking gun handle and trigger assembly comprising a body having a curved contour along one edge, pivot means adjacent one end of said curved contour, a cutting edge disposed along a second edge of said body and detent means carried by said body for selective engagement with one of a plurality of receiving means on a caulking gun handle.

4,802,608

SPICE DISPENSER ARRANGEMENT

Raimund Hofmann, Kreuzwertheim, Fed. Rep. of Germany, assignor to Jan Folkmar, Otelfingen, Switzerland

Filed Sep. 2, 1987, Ser. No. 92,012
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1986, 3629987; Sep. 23, 1986, 3632188; Jul. 28, 1987, 3724998
Int. Cl.[4] A47G 19/12
U.S. Cl. 222—142.1 10 Claims



1. A spice dispenser of the type having a housing defining a closable upper opening with oppositely situated first and second edges and having a plurality of closable spice chambers subdivided from each other by walls, the spice dispenser comprising:

a first closure lid, articulately and integrally connected to said first edge of said housing, defining an arrestor stud opening and a sprinkling opening, said first closure lid being displaceable in a closing position over said upper opening;

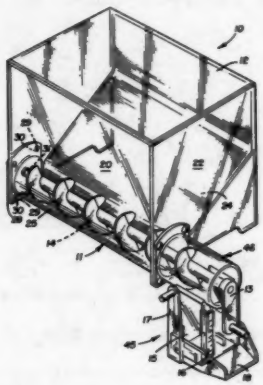
a second closure lid including a housing-facing surface, a weakening line in said surface dividing said second closure lid into a housing-connected portion and a flap portion, said housing-connected portion articulately and integrally connected to said second edge of said housing and displaceable over said first closure lid when in a closing position, said housing-connected portion including an arresting stud projecting from said surface for engaging and arresting said arrestor stud opening when said first closure lid is in a closing position, said flap portion including an incision extending away from said housing-connected portion thereby dividing said flap portion into at least two flaps, each said flap articulatable about said weakening line and adapted to expose said sprinkling opening in an opening position and adapted to close said sprinkling opening in a closing position.

4,802,609

SANITARY FOODSTUFF DISPENSER

Hugh B. Morse, 680 Wildwood Dr., Watsonville, Calif. 95076, and John V. Ciolino, 13558 Paseo Terrano St., Salinas, Calif. 93908

Filed Dec. 15, 1986, Ser. No. 941,732
Int. Cl.[4] B67D 5/38
U.S. Cl. 222—158 27 Claims



1. A sanitary foodstuff dispenser for dispensing a measured quantity of solid foodstuff comprising

a closed container defining a chamber adapted to be at least partially filled with a preselected quantity of solid foodstuff, said container comprising vertically disposed and flat front, back and side walls, and a single bottom wall including a flat wall portion secured in said container to slope downwardly from an upper end of said back wall towards a lower end of said front wall and terminating at an arcuate wall portion merging with said front wall,

a measuring cup means, having an upper end and an open bottom end, mounted on one of the side walls of said container adjacent to said front wall, for receiving said measured quantity of said foodstuff,

screw means exposed to the foodstuff in said chamber and extending over and openly communicating with the open upper end of said cup means for selectively filling said cup means with said measured quantity of foodstuff in response to rotation of said screw means, said screw means comprising a shaft having a plurality of flat blades secured in longitudinally spaced and split involute relationship thereon to extend radially therefrom to provide longitudinally spaced surface means on said blades for conveying a wide variety of said solid foodstuff therealong in a clog-free manner, said screw means substantially positioned within and conforming to the arcuate wall portion of said bottom wall and extending vertically above a juncture of the flat and arcuate wall portions of said bottom wall to freely receive foodstuff deposited on said screw means under the influence of gravity from the flat wall portion of said bottom wall,and

dispensing means, movably mounted on said cup means, for dispensing said measured quantity of foodstuff from said cup means.

4,802,610

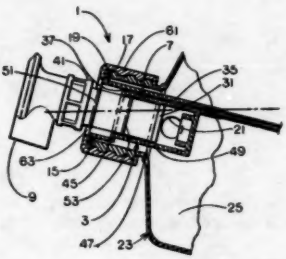
POUR SPOUT

Gary C. Cheek, Fountain Inn, and Andy Rice, Greenville, both of S.C., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 338, Jan. 5, 1987, abandoned. This application May 16, 1988, Ser. No. 196,831

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—481.5 **5 Claims**



1. A manually operable pour spout for engagement with an opening of a container with liquid therein for use in dispensing said liquid from said container, and in closing said container when not dispensing, comprising:

a valve body portion having side walls defining a first cylindrical cavity and a bottom wall closing said first cylindrical cavity at the bottom thereof, said valve body expanding above said first cylindrical cavity to form a first annular ledge generally concentrically encircling said cavity, said body portion extending above said annular ledge to define a second cylindrical cavity and said valve body forming a second annular ledge above said second cylindrical cavity, said second annular ledge having a top surface and a bottom surface for contacting said container opening, said valve body defining through said side walls at said first cylindrical cavity a passageway for fluid communication with the interior of said container;

a hollow cylindrical conduit slidably and sealingly received within said sidewalls to move along the axis of said body portion including a pouring orifice in the upper portion thereof and an opening in the bottom thereof which is positioned above said passageway for fluid communication with the container interior when said conduit is in an up position for dispensing and which descends below said passageway to preclude fluid communication when said conduit is in a down position for closing;

a vent tube in fluid communication with said first annular ledge;

means on the exterior of said conduit means for closing said vent tube at said first annular ledge when said conduit means is in said down position and for opening said vent when in said up position.

4,802,611

MOVABLE REFRACTORY PLATE ASSEMBLY WITH MOVABLE REFRACTORY CONTROL MEMBER

Otto Schuhmacher, Plankstadt, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

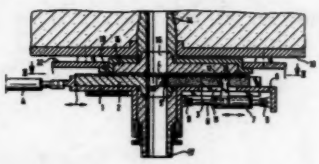
Filed Dec. 9, 1986, Ser. No. 943,938

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545764

Int. Cl.[4] B22D *41/08*

U.S. Cl. 222—600 **32 Claims**

1. In a sliding closure unit for controlling the discharge of molten metal from a metallurgical vessel, said unit including a casing to be fixed to the metallurgical vessel adjacent an outlet thereof, a stationary refractory plate mounted in said casing and having a discharge opening aligned with the vessel outlet, a movable refractory plate having therethrough a discharge opening, a movable frame supporting said movable refractory plate in planar abutting contact with said stationary refractory plate, and means for moving said movable frame and said movable refractory plate between an open position with said discharge openings of said movable and stationary refractory plates in alignment and a closed position with said discharge openings out of alignment, the improvement comprising means for, when said movable frame and said movable refractory plate are stationary and in said open position, selectively adjusting the size of said discharge opening in said movable refractory plate and thereby regulating the amount of molten



metal discharged therethrough, said adjusting means comprising:

a refractory control member mounted for sliding movement relative to said movable refractory plate between selected positions restricting the cross section of said movable refractory plate discharge opening;

means, operable independently of the operation of said moving means, for sliding said control member relative to said movable refractory plate between said selected positions; and

said control member and said sliding means being accessible from the exterior of said casing, at least when said movable refractory plate is in said closed position.

4,802,612

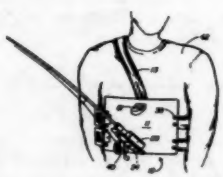
SPORTING APPARATUS SUPPORT DEVICE FOR THE HANDICAPPED

Emmett L. Anderson, 2992 Herrin Rd., #10, Helena, Mont. 59601

Filed Jan. 2, 1987, Ser. No. 191

Int. Cl.[4] A01K *97/10*

U.S. Cl. 224—208 **13 Claims**



1. A sporting apparatus support device for the handicapped comprising:

a substantially rectangular front body support plate having an upper portion, a lower portion, and either sides, and an elongate attachment bar extending upwardly and outwardly from the lower portion of said front support plate;

a transverse belt means for attachment around the torso of the wearer, said belt means attached to and extending from either side of said front support plate;

a back support plate having an upper portion, a lower portion, and either side; said back support plate attached to said belt means;

a fishing rod holder means removably attached to said attachment bar; and

a line-holding mans attached to the upper portion of said

front support plate wherein said line-holding means comprises an outwardly extending projection having at least one kerf.

4,802,613

INSTRUMENT SUPPORT APPARATUS

Mark D. Tierney, 709 Cramer Ave., Schenectady, N.Y. 12306

Continuation of Ser. No. 771,904, Sep. 3, 1985, abandoned. This application Dec. 8, 1986, Ser. No. 939,618

Int. Cl.[4] A45F *3/02*

U.S. Cl. 224—204 **3 Claims**

1. An apparatus for supporting a musical instrument in front of a person and evenly distributing the weight of the instrument over the shoulders and across the back of said person comprising:

a pair of substantially L-shaped belts, each said belt including a shoulder strap portion and a chest strap portion; each of said belts including a back belt, such that when worn the shoulder strap portions rest on each shoulder and extend down the back of the wearer, the back belts are interconnected by an adjustable buckle, and the chest strap portions extend around the front of the wearer and are attached together by an adjustable buckle to form the apparatus; the shoulder strap portions include a permanently fastened, adjustable instrument attachment means, such that the instrument is attached in front of the wearer at only one point, and the device provides freedom of movement of the instrument.

4,802,614

SURGICAL STAPLING INSTRUMENT AND CARTRIDGE

David T. Green, Norwalk, and Henry R. Sienkiewicz, Stamford, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed May 23, 1986, Ser. No. 866,800

Int. Cl.[4] A61B *17/00*

U.S. Cl. 227—19 **8 Claims**

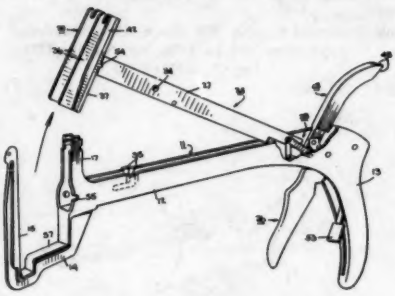
1. A surgical stapling instrument comprising

a frame having an anvil disposed at a distal end;

a first actuator means connected at a proximal end to said frame for movement between a closed position coaxial with said frame and an open position away from said frame to permit cleaning of said frame and said actuator means, said actuator means being reciprocally mounted within said frame when in said closed position;

a stapling cartridge holder integrally mounted on a distal end of said actuator means; and

a second actuator means connected to said frame and said first actuator means for movement between an open position away from said frame and a closed position within



said frame for reciprocating said first actuator means within said frame when in said closed position thereof.

4,802,615

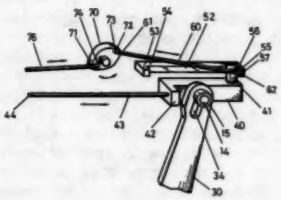
TAG ATTACHING APPARATUS

Duck H. Lee, 804-14, Bangbae-Dong, Kangnam-Ku, Seoul, Rep. of Korea

Filed Nov. 13, 1987, Ser. No. 120,143

Int. Cl.[4] A41H *37/00*; B25C *1/00*; B65C *5/06*; A43D *69/00*

U.S. Cl. 227—67 **2 Claims**



1. An apparatus for attaching a tag to a surface of a garment using fasteners, said fasteners being arranged in an assembly and being coupled to a common carrier member by respective coupling members, said apparatus comprising:

a body member having a hand portion,

a needle supported on one side of said body member,

a operating lever pivotally attached to said body member and provided with a spring member which is biased against the hand portion of said body member, said spring member having a substantially L-shaped configuration,

a drive lever pivotally connected at one end thereof to said operating lever,

a sliding member having a substantially L-shaped configuration, disposed in said body member, the other end of said drive lever being pivotably connected to said sliding member, said L-shaped sliding member having a fixed pin at the one end and a fastener pushing rod at the other end thereof,

a pawl member having a substantially U-shape for receiving said fixed pin, said pawl member being provided with a pivotal rod which is pivotally connected to a convertible member including a pivotal gear pushing rod, wherein when said fixed pin is moved in a forward and backward direction within said pawl member, said gear pushing rod moves in a backward direction and a forward direction, and

a stopper having a substantially V-shaped configuration about a pivot pin, said V-shaped stopper being fixed to

said gear pushing rod with a bias spring at one end and being able to operatively engage with teeth of a fastener feed gear wheel at the other end thereof for locking said gear wheel between the operation of a pushing plate which is operatively contacted to an upper end edge of said operating lever and said gear pushing rod, whereby, upon the squeezing of said operating lever against said hand portion of the body member, said tag is readily and easily attached to said surface of the garments by said fasteners with little effort being required by the user.

4,802,616

SYSTEM FOR POSITIONING AUTOMOTIVE VEHICLE SIDE BODY

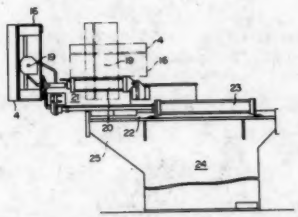
Kazuo Naruse, Okazaki; Mikio Kitano, and Hideaki Tobita, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Nov. 24, 1986, Ser. No. 933,870

Claims priority, application Japan, Nov. 29, 1985, 60-184169[U]

Int. Cl.[4] B23K 9/12, 37/04

U.S. Cl. 228—4.1 **4 Claims**



1. In an automotive vehicle body assembly line wherein two side bodies are moved forwardly along a body positioning path extending substantially perpendicular to an underbody conveyance path along which an underbody is supported at an elevated location above an assembly line floor for spot welding the sidebodies, a side-body positioning system, comprising:

a frame disposed on the assembly line floor and having an upper surface with an extreme forward edge and an opposite rear edge, said extreme forward edge opposing and spaced a predetermined lateral distance from the underbody conveyance path;

slide rail means mounted on said upper surface and extending axially in a direction defining the side body positioning path, said slide rails being mounted at an elevation substantially corresponding to the elevated location of the supported underbody;

a side body conveyor mounted on said slide rail means and movable in opposite directions along the side body coveyor path;

a stool having a pallet surface for removably supporting a pallet, said stool being mounted on said side body conveyor to pivot about a horizontal axis substantially perpendicular to the side body positioning path for positioning the plane of the pallet mounting surface in a first position substantially parallel to the upper surface of the frame and in a second position substantially perpendicular to the upper surface of the frame;

first means mounted on said upper surface of the frame for moving the conveyor along the rail means in the forward direction to a welding location for positioning the pallet mounting surface forward of the extreme forward edge of the upper frame surface; and

second means including a cylinder and piston and piston rod assembly mounted on said side body conveyor and connecting said stool and side body conveyor operative to pivot said stool from the first to the second position for placing the pallet mounting surface at the welding location for welding the supported underbody to the sidebody, said pallet mounting surface being disposed horizontally at times when said piston rod is fully extended from said cylinder of the assembly.

3. In an automotive vehicle body assembly line wherein two side bodies are moved forwardly along a body positioning path extending substantially perpendicular to an underbody conveyance path along which an underbody is supported at an elevated location above an assembly line floor for spot welding the sidebodies, a side-body positioning system, comprising:

a frame disposed on the assembly line floor and having an upper surface with an extreme forward edge and an opposite rear edge, said extreme forward edge opposing and spaced a predetermined lateral distance from the underbody conveyance path;

slide rail means mounted on said upper surface and extending axially in a direction defining the side body positioning path, said slide rails being mounted at an elevation substantially corresponding to the elevated location of the supported underbody;

a side body conveyor mounted on said slide rail means and movable in opposite directions along the side body conveyor path;

a stool having a pallet mounting surface for removably supporting a pallet, said stool being mounted on said side body conveyor to pivot about a horizontal axis substantially perpendicular to the side body positioning path for positioning the plane of the pallet mounting surface in a first position substantially parallel to the upper surface of the frame and in a second position substantially perpendicular to the upper surface of the frame, said stool being disposed between the extreme front edge and the rear edge of the frame at times when said pallet mounting surface is in the first position;

first means mounted on said upper surface of the frame for moving the coveyor along the rail means in the forward direction to a welding location for positioning the pallet mounting surface forward of the extreme forward edge of the upper frame surface; and

second means mounted on said side body conveyor operative to pivot said stool from the first to the second position for placing the pallet mounting surface at the welding location for welding the supported underbody to the sidebody.

4,802,617

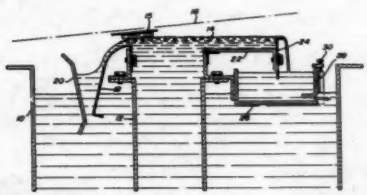
RESTRICTION OF DROSS FORMATION IN A SOLDERING APPARATUS

Carlos A. Deambrosio, LaPrairie, Canada, assignor to Electrovert Limited, Toronto, Canada

Filed Feb. 19, 1988, Ser. No. 158,308

Int. Cl.[4] B23K 3/06

U.S. Cl. 228—180.1 **19 Claims**



1. In a soldering apparatus wherein liquid solder is pumped upwards from a solder reservoir and falls from an overflow back into the reservoir, the improvement comprising a solder receiving tray positioned beneath at least a portion of the overflow to receive liquid solder falling from the overflow, and a level control means to limit the maximum solder level in the tray above a dynamic solder level in the reservoir, the

solder level in the tray being a predetermined distance below the overflow to limit dross formation thus restricting dross recirculation.

17. In a method of soldering wherein liquid solder is pumped upwards from a solder reservoir and falls from an overflow back into the reservoir, the improvement comprising the steps of:

catching at least a portion of the liquid solder falling from the overflow in a tray,

maintaining a level of solder in the tray at a predetermined distance below the overflow and above a dynamic solder level in the reservoir to limit dross formation thus restricting dross recirculation, and

draining the liquid solder from the tray into the reservoir with minimum turbulence.

4,802,618

LIGHTTIGHT ENVELOPE FOR HIGH-SPEED CONVEYANCE OF STIMULABLE PHOSPHOR SHEET

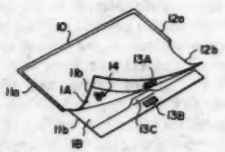
Kimio Seto, and Makoto Ohgoda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 31, 1984, Ser. No. 666,807

Claims priority, application Japan, Nov. 2, 1983, 58-206556

Int. Cl.[4] B65D 27/00

U.S. Cl. 229—68 R **9 Claims**



1. A lighttight envelope for high-speed conveyance of a stimulable phosphor sheet, which is fabricated of a flexible light shielding material and has a size sufficient to house the stimulable phosphor sheet therein,

the lighttight envelope comprising:

(i) an upper sheet and a lower sheet having approximately identical rectangular shapes, said upper sheet and said lower sheet being closely contacted with each other at least at one side thereof and at a significant portion of an adjacent side to said one side, and open at one side opposite to said closely contacted side and at less than entire portions of two sides adjacent the ends of said opposite side up to such positions that access to a part of the stimulable phosphor sheet housed in the lighttight envelope is allowed, and

(ii) a means for preventing said upper sheet and said lower sheet from separating from each other, said means being positioned at a part of said opposite side.

4,802,619

STORAGE AND TRANSPORT CONTAINERS FOR HEAVY AND/OR FRAGILE OBJECTS

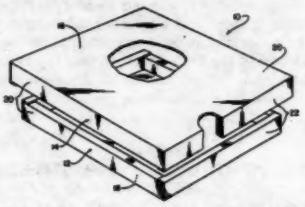
Michael Laido, 575 N. Midland Ave., Saddle Brook, N.J. 07662

Continuation of Ser. No. 935,776, Nov. 28, 1986, abandoned. This application Apr. 25, 1988, Ser. No. 185,428

Int. Cl.[4] B65D 5/20, 5/68

U.S. Cl. 229—125.19 **3 Claims**

1. A container comprising a box tray component including a rectangular bottom wall having integral extentions at each side and end edge, each of said extentions being provided with fold lines defining in sequence an outer panel, a top panel, an inner panel, a bottom panel and an interior panel, and a flap integrally extending from each lateral end of each interior panel of the pair of side extentions, said extentions being foldable into opposing pairs of rectangular cross-sectioned upstanding tubular walls with each of said extending flaps of said interior panels lying contiguous to an inner surface of an outer wall panel of a side extention, said cross-sectioned tubular walls



formed by said side and end extentions being at right angles to each other.

4,802,620

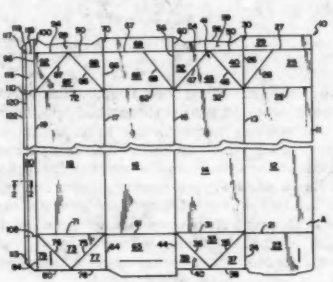
GABLE TOP CARTON FOR PREVENTING WICKING

Robert D. Phillips, Avon Lake, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Apr. 1, 1988, Ser. No. 176,623

Int. Cl.[4] B65D 5/06

U.S. Cl. 229—125.42 **6 Claims**



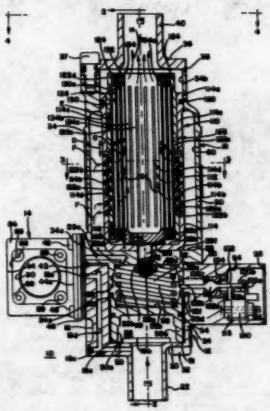
1. A blank for forming a gable top carton, said blank being formed from a single sheet of foldable stock material comprising a layer of paperboard material having opposed first and second surfaces and a layer of substantially fluid impervious material secured in face-to-face relationship with said paperboard material such that said fluid impervious material defines said first surface of said blank and the surface of said blank opposite said first surface defining a second surface thereof, said blank comprising first through fourth generally rectangular side wall panels and a side glue panel consecutively articulated to one another along parallel fold lines, first through fourth base panels and first through fourth top panels articulated respectively to said first through fourth side panels along fold lines extending substantially orthogonal to the consecutive articulations between said first through fourth side panels, a bottom glue panel, a top glue panel articulated to opposite ends of said side glue panel, a skived flap extending continuously along an edge of said blank and adjacent said side glue panel and said bottom glue panel and top glue panel, said skived flap being defined by a skived portion extending into the second surface of said blank and top seal panels articulated to the top panels of said blank, the articulation of the top glue panel to the associated top seal panel being defined by a pair of spaced apart perforations extending into the exterior surface of the blank.

4,802,621

THERMAL MODULATING CONTROL VALVE

Helmut Standke, Woodland Hills, Calif., assignor to Consolidated Controls Corporation, Bethel, Conn.

Filed Sep. 25, 1986, Ser. No. 911,335
Int. Cl.[4] G05D 23/02
U.S. Cl. 236—93 R 9 Claims



1. A thermo-modulating aircraft bleed air control valve comprising:

a valve chamber having inlet means for supplying high temperature bleed air into said chamber at an inlet end and an outlet for releasing temperature modulated bleed air from said chamber at an output end; and

valve means in said chamber between said inlet means and said outlet for regulating the flow of bleed air to said outlet in response to the temperature of said bleed air supplied to said chamber by said inlet means, said valve means comprising:

first elongated hollow cylindrical wall means separating said inlet means from said outlet, said first wall means having a plurality of axially spaced annular grooves on an interior face and a plurality of circumferentially spaced orifices in each of said grooves communicating between said grooves and an exterior face of said first wall means;

second elongated hollow cylindrical wall means disposed coaxially within said first wall means, said second wall means being axially movable with respect to said first wall means and having an exterior face slidably engaging said interior face of said first wall means, said second wall means having a plurality of axially spaced annular grooves on said exterior face thereof and a plurality of circumferentially spaced orifices in each of said grooves communicating between said grooves and an interior face of said second wall means, said second wall interior face defining an interior portion communicating with said outlet, and

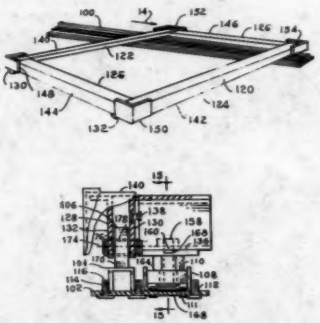
thermally responsive means disposed within said interior portion and connected to said second wall means for positioning said second wall means relative to said first wall means such that said annular grooves of said first and second wall means are in at least partial registry permitting bleed air to flow through said respective orifices and annular grooves from said inlet means to said outlet, said thermally responsive means being responsive to temperature of said bleed air for effecting movement of said seocnd wall means relative to said first wall means to move said annular grooves of said said second wall means toward a flow reducing position out of registry with said annular grooves of said first wall means as said bleed air temperature increases.

4,802,622

SINGLE TRACK MOBILE STORAGE STRUCTURE AND METHOD

John F. Homan, Brighton, Mich., assignor to Homan Company, Inc., Brighton, Mich.

Filed May 22, 1986, Ser. No. 866,465
Int. Cl.[4] A47B 53/00, 96/00
U.S. Cl. 238—10 R 8 Claims



3. A mobile storage system comprising a plurality of separate storage units, wheel assemblies for supporting the storage units connected to the storage units, at least one track with which the wheel assemblies are associated for guiding the separate storage units on movement of the separate storage units, and means operably associated with the tracks and storage units compensating the mobile storage systems for drift of the separate storage units along the track including means installing the one track with a predetermined slope other than 0°.

7. The method of installing a compact mobile storage system on a floor having a slope comprising installing guide means for a plurality of separate storage units and compensating for drift of the separate storage units of the mobile storage system including the step of installing the single track with a predetermined slope other than 0°.

4,802,623

CONCRETE CROSS SLEEPER SYSTEM

Günter Fasterding, Ilsede, and Jürgen Frenzel, Freden, both of Fed. Rep. of Germany, assignors to Stahlwerke Peine-Salzgitter AG, Peine, Fed. Rep. of Germany

Filed Jun. 9, 1987, Ser. No. 60,039
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1986, 3619417
Int. Cl.[4] E01B 9/04
U.S. Cl. 238—44 17 Claims

1. A cross sleeper for supporting a rail, said sleeper comprising:

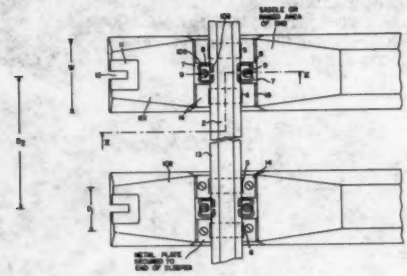
an elongated member having a center portion interconnecting two ends thereof;

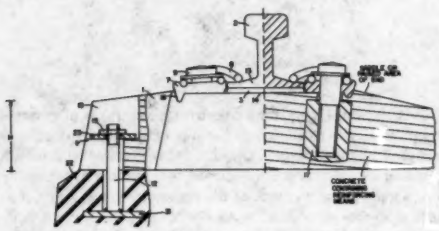
each of said ends being provided with two rail seats for supporting said rail, said two rail seats being spaced from one another transversely across each of said ends and along the direction of extension of said rail;

each of said two rail seats extending beneath said rail to include a portion at each side of said rail; and

tension means at said each side of said rail for resiliently clamping said rail to said two rail seats, said tension means effecting said clamping action on said each side of said rail, said tension means at said each side of said rail being

disposed between said portions of said two rail seats at said each sides of each said rail, whereby said tension means





and said two said seats provide triple point fixing at said each side of said rail.

4,802,624

RAIL CLIP ASSEMBLY HAVING A PIVOTED WEDGE MEMBER

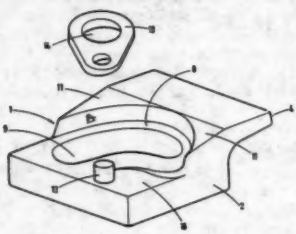
Ian M. Marchant, Ashstead, England, assignor to GH International Ltd., George Town,

Filed Aug. 17, 1987, Ser. No. 85,794

Claims priority, application United Kingdom, Aug. 28, 1986, 8620832

Int. Cl.[4] E01B 9/66

U.S. Cl. 238—317 **10 Claims**



1. A rail clip assembly comprising a body member which has a base portion for connection to a rail support surface and a lip portion which can, in use, overlie an edge of a rail, the body member having a first surface which, in use, extends parallel to the rail and abuts a lateral face of the rail, a second surface facing away from the first surface and an elongate slot for receiving a connector for connecting the body member to the rail support surface, the slot extending in a direction which is generally inclined with respect to the direction of extent of the rail, the assembly further comprising a pivoting member which pivots about a point which is located on the body member, the pivoting member including an aperture for registration with the slot and for receiving the connector, the pivoting member having a surface which contacts the said second surface of the body member, said second surface being at an angle to the plane of the rail support surface, whereby lateral forces applied by the rail are transmitted to the body, to the pivoting member, to the said connector and to the rail support.

4,802,625

ELECTROSTATIC SPRAY COATING DEVICE FOR COATING WITH POWDER

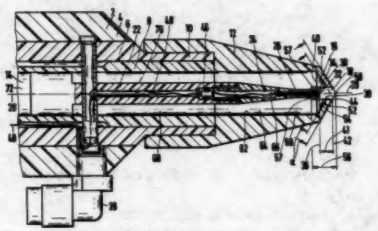
Karl Buschor, St. Gallen, Switzerland, assignor to Ransburg-Gema AG, Switzerland

Filed Mar. 6, 1987, Ser. No. 22,739

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, 3608415

Int. Cl.[4] B05B 5/00, 5/02, 1/28, 7/04

U.S. Cl. 239—3 **28 Claims**



15. A method of forming a powder spray jet for coating articles with powder, comprising the steps of:

passing coating powder through an elongated powder channel and discharging it at a spray opening at a downstream end thereof;

transmitting gas through at least one gas channel which has at least one gas outlet, the gas channel and its gas outlet being arranged substantially in the radial center of said powder channel upstream of its spray opening and discharging axially downstream toward said spray opening; and

supplying high voltage to at least one electrode disposed for having gas from the gas channel flow around it, said electrode being located in the gas outlet and having a downstream electrode end terminating substantially at the downstream end of the gas outlet;

damming and compacting the powder before it is discharged, in a damming region formed in the powder channel at a generally conical section thereof which becomes narrower substantially from the gas outlet to the spray opening in the downstream direction, and into which the gas outlet debouches;

the radial center of the spray opening being located substantially at the point of the smallest diameter of the channel section and opposite the gas outlet.

4,802,626

MOLDED SCENT IMPREGNATED DEVICES

David R. Forbes, and Carman S. Forbes, both of Hiawatha, Iowa, assignors to Hunter's Specialties, Inc., Cedar Rapids, Iowa

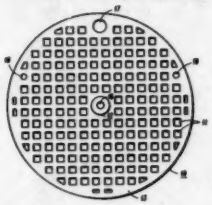
Filed Dec. 22, 1986, Ser. No. 943,958

Int. Cl.[4] A61L 9/00

U.S. Cl. 239—36 **5 Claims**

1. A scent impregnated device having at least one two-faced wafer of molded material impregnated with a scent, wherein each wafer comprises a circular disc having a plurality of

honeycombed perforations therethrough from face-to-face effective to allow air currents to flow therethrough from face-to-face, each of the wafer faces including attaching means disposed at the center thereof and molded integrally therewith



for manually removably attaching a plurality of the wafers together in stacked, axially aligning and spaced relation to each other by first axially aligning the wafers, then moving the same along the axis and finally engaging the attaching means.

4,802,627

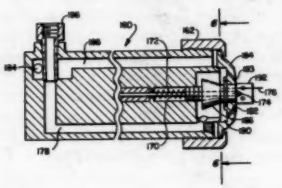
MODIFIED SPRAY GUNS FOR VAPOROUS AMINE-ASSISTED SPRAY COATINGS AND METHOD THEREFOR

Timothy Y. Moy, and Jeffery W. Radcliff, both of Dublin, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 930,721, Nov. 13, 1986, Pat. No. 4,771,946. This application May 27, 1988, Ser. No. 199,698

Int. Cl.[4] B05B *1/24, 15/02*

U.S. Cl. 239—112 **5 Claims**



1. In a spray gun for spraying atomized liquid with the assistance of a vaporous amine flow supplied from an amine line connected to an amine flow path in said gun, the improvement which comprises:

pressure regulation means followed by unidirectional flow valve means interposed in said amine line;

adjustable reference pressure sensing control means connected with said amine line after said amine line pressure regulation means to sense the pressure in said amine line;

pressure regulation means disposed in a control gas flow line which line is connected with said sensing control means as the reference pressure and which control gas flow is withdrawn from said sensing control means so long as the reference pressure in said amine line is greater than the pressure in the control gas flow line into said sensing control means;

two-way pilot actuated valve means interposed in a heated gas flow line which is at a pressure greater than the pressure in said amine line when said gun is idle, said control gas flow withdrawn from said sensing control means being the pilot therefor, whereby said pilot valve means is open only when said pilot control gas flow has gas flow therethrough;

unidirectional gas flow means interposed in a heated gas flow line which runs from said pilot valve means to the amine line at a point after said amine line unidirectional flow valve means, the control gas pressure regulation means being adjusted so that the control gas pressure is greater than the pressure in said amine line when said gun is spraying and there is gas flow therein, but the control gas pressure is less than the pressure in said amine line when the spray gun is idle and the pressure in the amine line increases because there is no gas flow therein;

wherein said gun has been modified so that said heated gas flow still passes through said gun when said gun is idle.

4,802,628

ROTOR NOZZLE FOR A HIGH-PRESSURE CLEANING DEVICE

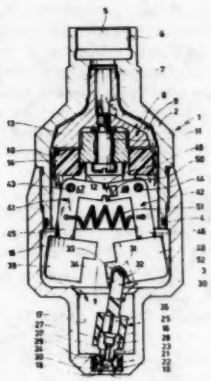
Heinz Dautel, Backnang, and Johann G. Wesch, Bergien, both of Fed. Rep. of Germany, assignors to Alfred Karcher GmbH & Co., Winnenden, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,193

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623368

Int. Cl.[4] B05B *3/04*

U.S. Cl. 239—227 **11 Claims**



1. Rotor nozzle for a high-pressure cleaning device comprising:

a housing,

a rotor mounted for rotation in said housing, said rotor being made to rotate by the cleaning liquid,

a driver connected to said rotor and spaced radially from the axis of rotation of said rotor,

a nozzle arranged downstream from said rotor, the exit axis of said nozzle forming an acute angle with the axis of rotation of said rotor,

a cup-like member open at its center and held on said housing

an elongate member that mounts said nozzle to form a nozzle assembly that is supported at one ball-shaped end in said cup-like member

said driver engaging the other end of said nozzle assembly in a matter that enables free rotation of said nozzle assembly about the longitudinal axis of said elongate member relative to said rotor

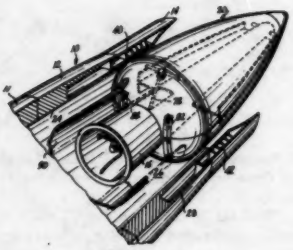
and said rotor connected to said driver rotating said nozzle assembly about the fixed axis of said rotor such that the exiting jet of cleaning fluid moves around the lateral area of a cone.

4,802,629

PLUG-TYPE EXHAUST NOZZLE HAVING A VARIABLE CENTERBODY AND TRANSLATING SHROUD

Garry W. Klees, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 22, 1982, Ser. No. 436,006
Int. Cl.[4] F02K 1/08, 1/09
U.S. Cl. 239—265.19 18 Claims



1. An exhaust nozzle for containing and directing the flow of exhaust gases generated by a gas turbine engine, comprising:

an annular nozzle housing mountable to the aft end of said gas turbine engine so as to extend rearwardly therefrom;

an annular shroud coaxially mounted to the aft end of said nozzle housing for axial sliding movement relative to said housing, said shroud being movable along a translational path between a forwardmost position and a rearmost position, said shroud having an inwardly facing surface for defining a flow passage for receiving said exhaust gases generated by said gas turbine, a first portion of said inwardly facing surface adjacent a forward end of said shroud being configured to form a flow passage of constant cross-sectional area, and a second portion of said inwardly facing surface adjacent said first portion configured to form a flow passage of increasing cross-sectional area in the aft, axial direction;

a support tube mountable to the aft end of said gas turbine to extend rearwardly therefrom, said support tube being mounted coaxially within said nozzle housing and said shroud; and

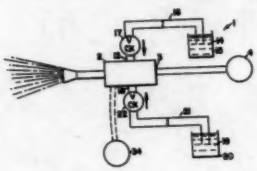
a variable circumference centerbody axially mounted on said support tube within said flow passage of said shroud forming a throat passage between said inner surface of said shroud and said centerbody, said centerbody including a first shell and a second shell, said first and second shells each having a forward end and an aft end, the edges of said first and said second shells abutting one another along a plane that is parallel to the central axis of the exhaust nozzle when said shells are in a retracted position, the aft ends of said first and said second shells being pivotally attached to said support tube for pivotal movement of the forward ends of said shells away from one another into an extended position, said first and said second shells being configured to vary the cross-sectional flow are of said throat passage by cooperation between the pivotal movement of said shells and the translational movement of said shroud, said variable centerbody being positioned axially within said shroud to be adjacent said first and said second portions of said inwardly facing surface of said shroud when said shroud is moved axially, said throat passage being at a minimum area when said shroud is translated to its rearmost position and said centerbody is in retracted position, and said throat passage being at a maximum area when said shroud is translated to its forwardmost position and said centerbody is in an extended position.

4,802,630

ASPIRATING FOAMER

Edward P. Kromrey, Osceola, Wis., and Richard J. Mehus, Berkhire, England, assignors to Ecolab Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 799,423, Nov. 19, 1985, abandoned. This application Oct. 6, 1986, Ser. No. 914,054
Int. Cl.[4] B05B 7/04
U.S. Cl. 239—428 14 Claims



6. A nozzle for generating foam by turbulently mixing a liquid medium with a plurality of liquid products, comprising:

(a) a longitudinal inlet path, the longitudinal inlet path permitting the introduction of the liquid medium into the nozzle, the longitudinal inlet path having a longitudinal axis;

(b) a longitudinal exit path, the longitudinal exit path having a lengthwise axis, the lengthwise axis being coaxial with the longitudinal axis of the longitudinal inlet path;

(c) a first liquid product inlet path directed into the nozzle at an orientation normal to the longitudinal axis of the first inlet path, the first liquid product inlet path having a major axis aligned such that a first liquid product flows in a direction substantially aligned with the major axis;

(d) a second liquid product inlet path directed into the nozzle at an orientation normal to the longitudinal axis of the first inlet path, the second liquid product path having a flow axis that is coaxial with the major axis of the first liquid product inlet path; and

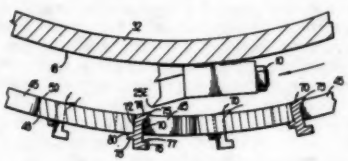
(e) an aspiration inlet path, the aspiration inlet path being located in a first plane normal to a second plane containing the longitudinal exit path, longitudinal inlet path, and first and second liquid product inlet paths.

4,802,631

WINGED CUTTING KNIFE FOR PRODUCING WOOD CHIPS OR FLAKES

Stanley Arasmith, P.O. Box 2458, Rome, Ga. 31064

Division of Ser. No. 917,855, Oct. 14, 1987, Pat. No. 4,776,375. This application Nov. 23, 1987, Ser. No. 124,043
Int. Cl.[4] B02C 17/02
U.S. Cl. 241—88.1 12 Claims



1. A wood processing machine for reducing the size of a wood member into reduced wood portions, comprising:

a separating grate having a first and a second side, and defining at least one filtering slot, said filtering slot including a leading and a trailing edge;

means for transporting said wood member along a path defined by said first side of said grate, such that said wood

member is first directed over said leading edge of said slot and thereafter toward said trailing edge of said slot;

means defining at least one cutting edge, said means extending from said trailing edge of said slot; and

means extending from said cutting edge for directing wood portions into said slot,

such that said cutting edge engages said wood members, and removes a portion of said wood member having a size sufficient to pass through said slot, and said directing means directs said wood portion through said slot.

4,802,632

METHOD AND APPARATUS FOR TREATING END PORTION OF ROLL PAPER

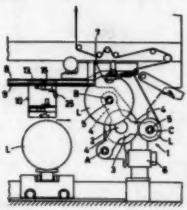
Akira Fukuda, Osaka, and Itsuro Masuda, Higashiosaka, both of Japan, assignors to Hamada Printing Press Mfg. Co., Ltd., Osaka, Japan

Filed Mar. 2, 1988, Ser. No. 163,335

Claims priority, application Japan, Nov. 12, 1987, 62-287789

Int. Cl.[4] B65H *19/18*

U.S. Cl. 242—58.5 **5 Claims**



1. A device for treating the end portion of a paper roll mounted on a paper feed unit of a paper processor and located at a splicing position, said device comprising a driving means adapted to be brought into contact with said paper roll to rotate it, a support frame movable toward and away from said paper roll, a presser roller rotatably mounted on said support frame and adapted to be rotated by contact with said paper roll, a cutter means disposed below said presser roller for transversely cutting a plurality of turns of paper on said paper roll as broke with a cutter movable radially and axially of said paper roll, a suction conveyor means provided below said cutter means and including a suction box elongated transversely of said paper roll, a belt roller and a plurality of perforated belts passed around said suction box and said belt roller so as to extend parallel to one another, said suction box being formed with suction openings at the side behind said paper roll so that they will be aligned with said perforations formed in said belts, nip rollers for holding said broke fed downwardly from said suction conveyor means, a cavity forming means for forming a cavity in the end portion of said paper roll fed together with said broke into between said suction conveyor means and said nip rollers, and a tab sticking means for sticking the upper part of a tab on said paper end at a portion right over said cavity formed by said cavity forming means.

4,802,633

MOVABLE CARTRIDGE LOCK

Jack Beery, Centerville, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 22, 1988, Ser. No. 209,714

Int. Cl.[4] G03B *17/26*; B65D *85/66*

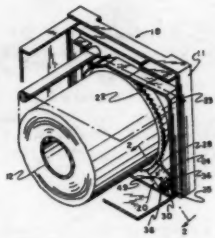
U.S. Cl. 242—71.1 **14 Claims**

1. In a spool type cartridge containing at least one spool of web material, which material may be readily extracted when the cartridge is placed in utilization apparatus, and which spool is locked against rotation during shipping and handling prior to insertion in such utilization apparatus, the improvement in spool locking structure, comprising:

means associated with said spool and connected for rotation therewith defining a locking portion,

a locking member having a relatively fixed portion and a locking portion movable into and out of engagement with said spool locking portion,

means on said locking member defining a bendable connection joining said movable locking portion with said fixed



portion and normally maintaining said movable portion in locking engagement with said spool,

said locking member being movable on said fixed portion by bending movement of said connection beyond the elastic limit of the material of said connection, and

means operable upon the placement of said cartridge in said utilization apparatus to disengage said locking member from said spool accompanied by said bending at said connection providing for a permanent disengagement of said member.

4,802,634

BELT REEL-IN MECHANISM

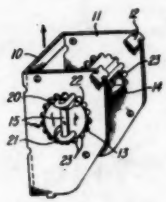
Kalus P. Singer, Hamburg, Fed. Rep. of Germany, assignor to Autoflug GmbH & Co. Fahrzeugtechnik, Reilingen, Fed. Rep. of Germany

Filed Apr. 24, 1987, Ser. No. 42,414

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614283

Int. Cl.[4] B60R *22/38, 22/40*

U.S. Cl. 242—107.4 A **14 Claims**



1. In a self-locking belt reel-in mechanism having a belt-winding spindle that is mounted in a housing and is loaded by a rewinding spring, where said belt-winding spindle comprises a spindle core and a spindle body, at each end of which are disposed two locking members that operate radially between an inner position and an outer position, are surrounded by stops on said housing, and bring about a symmetrical quadruple locking, with said locking members being coupled by connecting rods that are parallel to the central axis of said belt-winding spindle, are disposed within the cross-sectional area of said spindle, and rotate with the latter, and with said locking members meshing with said housing stops when self-locking is

initiated via a system that is sensitive to the movement of the belt and/or of the vehicle, the improvement therewith which comprises that:

said connecting rods have ends on which are integrally connected said locking members, which axially embrace and surround said spindle core symmetrically relative to the respective connecting rod; and

said housing stops are toothings, with said locking members being pivotable about the longitudinal axis of their connecting rod in a radially outward direction until they mesh in said toothings.

4,802,635

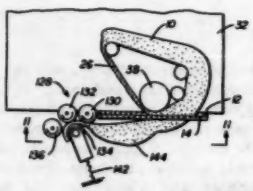
APPARATUS AND METHOD FOR COMPACTING A SCRAP TIRE

Randel L. Barclay, 5616 Carpenter Rd., Stockton, Calif. 95205

Continuation-in-part of Ser. No. 001,686, Jan. 9, 1987, Pat. No. 4,738,172. This application Sep. 9, 1987, Ser. No. 94,714

Int. Cl.[4] B02C *18/06, 23/02*; B26D *7/14*

U.S. Cl. 241—30 **16 Claims**



1. A method of compacting a tire of a type having a circular crown portion, a tire axis, laterally opposed first and second side walls and having a bead wire within each side wall, said crown portion having an exterior surface and an interior surface, comprising,

providing a linear debeaded tire casing having a length about as great as the circumference of the tire crown portion, and

coiling said debeaded tire casing about a coil axis.

4,802,636

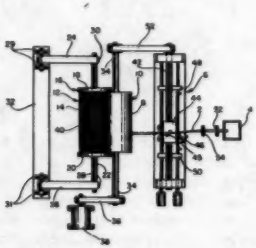
METHOD AND APPARATUS FOR LEVEL WINDING ELASTOMERIC RIBBON

Richard H. Frick, Neenah; Hugo L. Kons, and Marion C. Morris, both of Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 26, 1982, Ser. No. 342,965

Int. Cl.[4] B65H *18/08*

U.S. Cl. 242—67.1 R **8 Claims**



1. In apparatus for winding elastomeric ribbon into a ribbon roll, the appratus being of the type including (i) a reel on which the ribbon roll is formed that has a rotatable shaft and spaced apart end caps, (ii) drive means for rotating the reel, and (iii) traverssing means for reversibly guiding the ribbon in directions parallel to the axial length of the reel to distribute the turns of the ribbon roll along the axial length of the reel with a gap between each end cap of the reel, and the ribbon

the improvement wherein:

(1) the drive means includes a drive roll engaging the ribbon roll formed on the reel,

the drive roll being positioned between the traversing means and the reel so that the elastomeric ribbon travels first across the traversing means, around the drive roll and thereafter onto the reel;

(2) pivotable means for supporting the shaft of the reel to pivot the ribbon roll into engagement with the drive roll for rotation thereof by the drive roll; and

(3) guide means for guiding the elastomeric ribbon to the traversing means in an elongated condition;

the ribbon roll having a ribbon node at each of its axial ends, each ribbon node comprising at least one ribbon turn due to layering of ribbon turns while the traversing means is reversing the traverse direction of the ribbon; and

each ribbon node being spaced a distance from the end cap to define the gap therebetween, said distance being sufficient to permit the turns of the ribbon node to slide into the gap such that said node collapses.

4,802,637

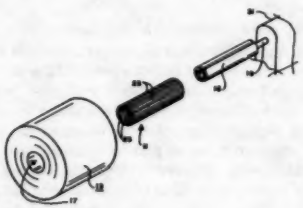
APPARATUS FOR BEING POSITIONED ON AN EXPANDABLE MANDREL

Logan D. Williams, 7395 Cotton Plant Cove, Memphis, Tenn. 38119

Filed Apr. 22, 1988, Ser. No. 184,679

Int. Cl.[4] B65H *75/24*; B23B *31/40*

U.S. Cl. 242—72 R **5 Claims**



1. An apparatus for being positioned between the outer circumference of an expandable mandrel and the inner circumference of a roll of sheet material; said apparatus comprising:

(a) a plurality of elongated, rigid beam members, each of said beam members having at least one transverse aperture therethrough; and

(b) elastic means extending through said transverse apertures of said beam members for joining said beam members to one another to form an expandable sleeve for being inserted over said outer circumference of said expandable mandrel and for being inserted into said inner circumference of said roll of sheet material.

4,802,638

CORD STOWAGE APPARATUS

Marilyn S. Burger, Pompano, and John M. McKee, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 29, 1987, Ser. No. 79,052

Int. Cl.[4] B65H *75/40*

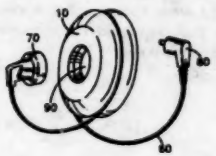
U.S. Cl. 242—85.1 **12 Claims**

1. A cord stowage apparatus for stowing cord comprising:

a spool including first and second opposed ends, the spool including a channel through which the cord slides when the apparatus is being positioned on the cord;

a first flexibly resilient cup-shaped member including a rim and a center connected to the first end of the spool, the first member being positionable in first and second positions, the first position being defined such that the first member includes a substantially concave surface which faces away from the spool, the second position being defined such that the first member includes a substantially concave surface which faces toward the spool,

a second flexibly resilient cup-shaped member including a rim and a center connected to the second end of the spool,



the second member being positionable in third and fourth positions, the third position being defined such that the second member includes a substantially concave surface which faces away from the spool, the fourth position being defined such that the second member includes a substantially concave surface which faces toward the spool,

the rims of the first and second members engaging the cord therebetween when the first and second member are in the second and fourth positions, respectively.

4,802,639

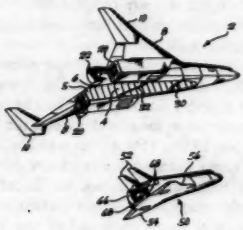
HORIZONTAL-TAKEOFF TRANSATMOSPHERIC LAUNCH SYSTEM

Richard Hardy; Jonathan Hardy, both of Seattle; Thomas J. Kornell, Federal Way, and Kenneth M. Tallquist, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 656,159, Sep. 28, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 919,207

Int. Cl.[4] B64G 1/14

U.S. Cl. 244—2 **37 Claims**



24. A method of launching a transatmospheric vehicle, comprising:

providing an aircraft of the type having an air breathing engine;

providing the aircraft with a rocket engine, and providing the transatmospheric vehicle with a scramjet engine;

releasably connecting the aircraft and the transatmospheric vehicle together;

operating said air breathing engine to accomplish a horizontal takeoff of the connected aircraft and vehicle;

flying the connected aircraft and vehicle, including igniting said rocket engine and then accelerating to a Mach number of about 3.3 and climbing to an altitude sufficient to allow said vehicle to attain orbit and accomplish a predetermined mission;

while so accelerating and climbing, igniting said scramjet engine; and

upon reaching said Mach number and altitude, releasing the aircraft and said vehicle from each other and flying the aircraft and said vehicle independently of each other; including operating said scramjet engine to cause the separated transatmospheric vehicle to continue to accelerate to a velocity exceeding orbital velocity and climb to about the maximum altitude at which the scramjet engine can function, and then allowing said vehicle to coast to orbital altitude.

4,802,640

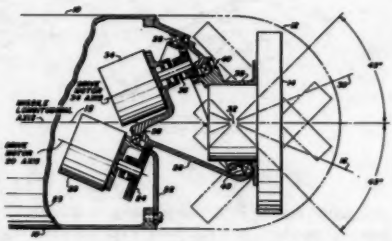
OBLIQUE AXIS SEEKER

James B. Reid, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 18, 1978, Ser. No. 943,598

Int. Cl.[4] F41G 7/00; F42B 15/02; G06F 15/50

U.S. Cl. 244—3.19 **8 Claims**



1. A platform translator mechanism for moving a platform with respect to a mounting body in a vehicle, said vehicle having a direction of motion along a longitudinal axis, comprising:

(a) a first connecting member having a first portion and a second portion, said first portion being rotatable with respect to said second portion about a first axis, said first portion being attached to the mounting body;

(b) a second connecting member having a first segment and a second segment, said first segment being rotatable with respect to said second segment about a second axis, said first segment being attached to said second portion, said second segment being attached to the platform; and

(c) said first axis and said second axis intersecting at an oblique angle and at a point approximately coincident with the center of gravity of the platform and each of said first axis and said second axis being at an oblique angle with respect to the longitudinal motion axis.

4,802,641

METHOD OF PROVIDING RAPID CONVERSION OF AN AIRCRAFT WEAPON CARRIAGE

Richard Hardy, Seattle, and Frank D. Neumann, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1985, Ser. No. 781,657

Int. Cl.[4] B64D 1/06

U.S. Cl. 244—137.4 **7 Claims**

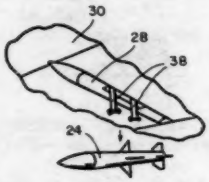
1. A method of providing rapid conversion of an internal weapon carriage for folded fin or relatively small fin weapons to an external weapon carriage for relatively large fixed fin weapons carried in a semi-submerged configuration, said weapon carriage having a mounting mechanism adapted to mate with mounting mechanisms of said weapons, the steps comprising:

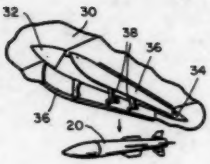
removing a folded or relatively small fin weapon from a

removable quick-connect weapon housing if one is therein;

removing the quick-connect housing consisting of front and rear fairings with built-in doors therebetween from the aircraft;

installing a relatively large fixed fin weapon on said weapon carriage, said large fixed fin weapon having a mounting





mechanism mating with the mounting mechanism on said weapons carriage, said relatively large fin weapon occupying the space that is occupied by said removable housing when folding or relatively small fin weapons are carried on said weapon carriage; and

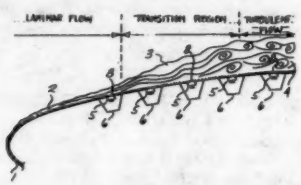
raising the weapon from a launch position to a cruise position on the aircraft, with at least one fin of said large fixed fin weapon projecting from said aircraft.

4,802,642

CONTROL OF LAMINAR FLOW IN FLUIDS BY MEANS OF ACOUSTIC ENERGY

Rudolph A. Mangiarotty, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 14, 1986, Ser. No. 918,229
Int. Cl.[4] B64C *23/00*
U.S. Cl. 244—200 **11 Claims**



1. A method for retarding the onset of turbulent boundary layer flow around an airfoil moving with respect to an air mass through the infusion of acoustic energy into the boundary layer comprising the steps of:

(a) electronically generating acoustic energy at or near the surface of an airfoil moving through an air mass and having a laminar flow boundary layer over at least a portion of said surface of said airfoil,

(b) providing a plurality of predetermined acoustic energy emitting locations upon said airflow surface over which said boundary layer flow is laminar, and

(c) directing said electronically generated acoustic energy into said boundary layer from said plurality of predetermined acoustic energy emitting locations,

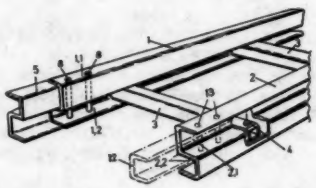
wherein the step of electronically generating includes generating said acoustic energy as a band of random noise having wavelengths not greater than one half of a predetermined critical wavelength of Tollmien-Schlichting oscillatory disturbance waves present within said boundary layer in the absence of said generated acoustic energy, such that said band of random noise forms wave patterns that destructively interfere with the formation of said Tollmien-Schlichting oscillatory disturbance waves.

4,802,643

CABLE LADDERS

Pieter Uys, 99 Park Road, Newton, Johannesburg, Transvaal, South Africa

Filed Sep. 15, 1987, Ser. No. 96,949
Claims priority, application South Africa, Sep. 29, 1986, 86/7391
Int. Cl.[4] F16L *3/22*; E06C *7/08*
U.S. Cl. 248—49 **1 Claim**



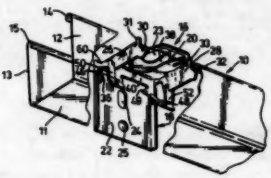
1. A cable ladder which comprises two rails joined together by rungs, of which the rails are of glass fibre reinforced resin the result of a pultrusion process, the cross section of the rails is S-shaped oriented with the left rail a mirror image of the right rail, the upper part of each S-shape presenting an outwardly directed channel portion and the lower part an inwardly directed channel portion, and the channel presenting extended flanges about as long as the webs, the section thickness being between 10 and 15% of the width of each channel, the ends of the rungs entering the inwardly directed channel portions of each rail clamped in a tight fit between the extended flanges, the rungs being of box section, a vertical glass fibre dowel pasing through each end of the rungs and the inwardly directed channel portion with glue bonding between rung end and channel portion, the following has said cable ladder spliced to another similar cable ladder by a splint comprising a short length of rail having the same S-cross section as the ladder rails, the width of one channel being smaller than the width of the other larger channel by the sum of the section thickness of the flanges of the larger channel and the splint being turned around to snugly fit in the ladder rails, with fastening dowels passing vertically through the ladder rails from a top flange surface through the splint and to a bottom flange surface thus stiffening the section and glue bonding the splint, the dowels, and ladder rails, the dowels thus shielded from the space between the rails above the cross rungs on which cables can be carried.

4,802,644

BLIND HEADRAIL BRACKET

Herman Oskam, Vlist, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Feb. 1, 1988, Ser. No. 150,574
Claims priority, application United Kingdom, Feb. 5, 1987, 8702604
Int. Cl.[4] A47H 1/14
U.S. Cl. 248—251 11 Claims



1. A bracket for releasably securing a channel section blind headrail to a horizontal or vertical surface, said channel section blind headrail including a web and upwardly extending front and rear flanges, each having an inturned rim at its upper free edge, said bracket comprising:

(a) a main body formed as a thin metal component securable to a vertical or horizontal surface;

(b) at least one supporting portion on the body, supportingly engageable with one of said rims;

(c) a member also formed as a thin metal component and movably associated with the body;

(d) at least one supporting part of said member supportingly engageable with the other rim, the member normally holding a first position with respect to the body, and being capable of being forcedly removed to a second position with respect to the body against a resilient force acting to hold it in the first position, in which second position the member cannot engage the other rim;

(e) a horizontal part of said member slidably interengaged in a horizontal plane with said body;

(f) a thin operating tongue on said member projecting forwardly beyond the front end of the body to the extent that it will extend above and past the front flange of a headrail when mounted on the bracket;

(g) at least one supporting part at the rear of said member;

(h) a U-shaped portion of said member with first and second legs and a web portion, said legs being angled with respect to the horizontal plane, the first leg being connected near or at one end to said horizontal part of the member and at the other end, through said web portion, to the second leg; and

(i) an abutment of said second leg substantially spaced from and positioned to abut a portion of said body to restrain said second leg, whereby, when a pulling force is exerted on said tongue, said legs flex and provide said resilient force.

4,802,645

SYRINGE HOLDER

Gary T. Chiodo, 7015 SE. 34th Ave., Portland, Oreg. 97202

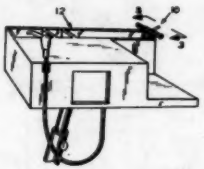
Filed Feb. 1, 1988, Ser. No. 151,227
Int. Cl.[4] A47F 5/00
U.S. Cl. 248—309.1 3 Claims

1. For use together with a syringe assembly comprising a syringe body, a syringe needle attached to one end of the body, a finger grip attached to the other end of the body, an operating piston working within the body and extending outwardly through the finger grip, and a protective cap for the needle, open at one end; a syringe holder comprising:

(a) a syringe body support comprising a cradle-shaped support member, open at the top

(b) a cap support at one end of the body support arranged therewith the open end of the cap facing inwardly, the cap support comprising a cradle-shaped member, open at the top and merging with the body support; and

(c) releasable cap securing means positioned for releasably securing the cap in a position to receive the syringe needle



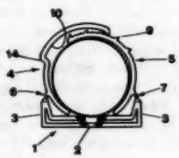
when the syring body is placed on the syringe body support, to secure the cap when the syringe is removed from the syringe body support after each use, and to release the cap when the syringe and cap are removed together from the support for disposal after use.

4,802,646

CLAMP FITTING, IN PARTICULAR FOR PIPES AND TUBE

Augusto Cattani, Parma, Italy, assignor to Officine Augusto Cattani & C. S.p.A., Italy

Filed Dec. 22, 1987, Ser. No. 136,289
Claims priority, application Italy, Jan. 30, 1987, 2890/87[U]
Int. Cl.[4] F16L 3/08
U.S. Cl. 248—316.5 6 Claims



1. A clamp arrangement comprising

a clamp having a base with a substantially flat inside surface,

two support elements extending upwardly from said base, first and second engaging elements each having a body with an arc-shaped configuration, each said engaging element having fastening means at a first end thereof for fastening said engaging elements together,

a second end of each said engaging element is free,

each said engaging element is pivotally attached to one said support element at a point between said first and second ends,

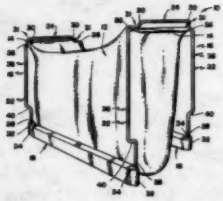
when an element to be clamped is inserted into the clamping arrangement said first and second engaging elements are pivotally moved about said support elements so that said free second ends of the first and second engaging elements support the element to be clamped from underneath to ensure smooth movement of the element within the clamp, whereby in the locked condition said free second ends of the first and second engaging elements engage the substantially flat inside surface of the base in such a manner that substantial gaps are defined between said free second ends and the element to be clamped, and said element to be clamped is received by the arc-shaped engaging elements and the substantially flat surface of the base.

4,802,647

TRASH BAG HOLDER

James M. Celmayster, 1238 Nopal St., Santa Barbara, Calif. 93103, and Alain J-M Clenet, 1211 Harbor Hill Dr., Santa Barbara, Calif. 93109

Filed Jan. 4, 1987, Ser. No. 58,033
Int. Cl.[4] A63B 55/04
U.S. Cl. 248—544 10 Claims



1. A trash bag holder comprising: a pair of inverted U-shaped supports each of which has a pair of generally vertically extending legs and an upper connecting portion that extends between the legs; each support having each leg thereof provided with an upper bight portion adjacent the connecting portion and each leg also having a lower distal end remote from the connecting porton; the connecting portion of each support having a laterally elongated U-shaped configuration that is inclined with respect to the legs and has laterally spaced ends that cooperate with the upper bight portions of the legs connected thereto to define support notches for receiving a trash bag handle looped over the connecting portion; the legs of each support having lower bight portions that cooperate with the upper bight portions to provide bight formations of the legs; a pair of elongated bases that each extend between the pair of supports in a spaced and parallel relationship to each other; each base having opposite ends including connection holes that respectively receive distal leg ends of both inverted U-shaped supports such that the supports position the bases in a spaced relationship to each other and are supported thereby with the connecting portions inclined away from each other such that the support notches receive and support the trash bag whose handles are looped over the inclined connecting portions; and each base having a pair of slots that receive the bight formations to locate the supports and bases with respect to each other prior to use and for storage when use is not necessary.

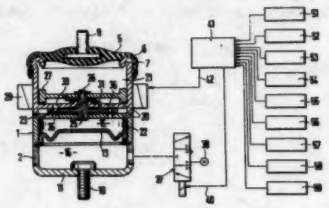
4,802,648

ADJUSTABLE ENGINE MOUNT

Heinz Decker, Vaihingen; Ortwin Engler, Stuttgart, and Walter Kuhle, Neckarwestheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,380
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705579
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—550 12 Claims

1. An adjustable engine mount for supporting a drive unit relative to a vehicle body, said adjustable engine mount including a damping chamber (15) which is divided into two chambers by a perforated partition and further including an elastic spring element, an air cushion (16) disposed in said adjustable engine mount in series with or parallel to said damping chamber (15), a valve device (37) in communication with said air cushion for pressurizing or depressurizing said air cushion, means adapted to connect said engine mount to an electronic control unit whereby magnitude of the damping of said engine mount can be varied as a function of control signals of said control unit, wherein the electronic control unit (41) has an input which communicates with the output of a measurement pickup via which the magnitude of the engine motion is detected, and further that the electronic control unit (41) has an output for control signals that are arranged to communicate with the input of an actuating device (29), said actuating device



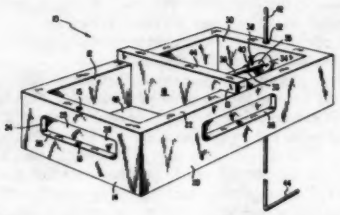
adapted to define communication between said two chambers (21, 22), and said valve device (37) includes an electronic control input that communicates with an output of said electronic control unit (41).

4,802,649

APPARATUS FOR MAKING AN ADOBE BRICK STRUCTURE

Thomas D. Salazar, Rte. 9, Box 86DS, Sante Fe, N. Mex. 87505

Filed Aug. 18, 1987, Ser. No. 86,480
Int. Cl.[4] B28B 7/02; E04G 11/20
U.S. Cl. 249—21 14 Claims



1. An apparatus for making an adobe brick structure comprising:

a rectangular shaped device having an open top and bottom defining a hollow volume for receiving adobe mud including two pairs of parallel planar sides, each said side having an inside face and an outside face;

a first planar edge, extending around the perimeter of said rectangular shaped device, for defining a top edge of said rectangular shaped device;

a second planar edge, extending around the perimeter of said rectangular shaped device, for defining a bottom edge of said rectangular shaped device;

a handhold means, forming a cavity on the outside face of each of said planar sides, for maneuvering said rectangular shaped device;

means for adjusting said rectangular shaped device so that said volume is capable of selectively receiving different amounts of adobe mud to form different size adobe bricks; and

means for stabilizing said rectangular shaped device being perpendicularly mounted to said device relative to a plane defined by said second planar edge.

4,802,650

INTRAVENOUS DRUG MIXING AND FLOW DEVICE

Saul Stricker, Marblehead, Mass., assignor to Abiomed, Inc., Danvers, Mass.

Filed Jun. 29, 1987, Ser. No. 67,940
Int. Cl.[4] F16K *7/06, 47/08;* A61M *5/00*
U.S. Cl. 251—117 7 Claims

1. A flow restrictor for inclusion in an infusion flow path to define a determined flow rate of infusate, such flow restrictor comprising

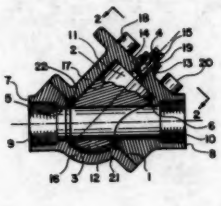
a first flow tube having a peripheral wall and first and second ends with first and second end connectors adapted for fluid connection into an infusion set, said peripheral wall defining a continuous normally open passage with an interior cross section of a size to not substantially restrict flow through said set, said peripheral wall further being flexible such that opposed regions thereof may be pinched together to occlude the normally open passage, and a second flow tube integral with said peripheral wall and defining at least in part a parallel flow path between said first and second ends, said second flow tube being adapted to restrict flow to said determmined flow rate, and being substantially rigid so that the parallel flow path remains open when said peripheral wall is clamped thereby assuring that fluid flows at at least said determined rate.

4,802,651

BALL PLUG VALVE

Hyok S. Lew, and Yon S. Lew, both of 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 372,462, Apr. 4, 1982, Pat. No. 4,702,457. This application Sep. 14, 1987, Ser. No. 96,150
The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.
Int. Cl.[4] G16K *25/00*
U.S. Cl. 251—161 20 Claims



1. An apparatus for shutting off and/or controlling fluid flows comprising in combination:

(a) a valve body including a cylindrical cavity with a generally hemispherical end, and two flow passages respectively extending from said cylindrical cavity to two extremities of the valve body wherein at least one of the two flow passages has an opening emerging through the hemispherical surface of the hemispherical end of said cylindrical cavity;

(b) a cylindrical plug with a generally hemispherical end engaging said cylindrical cavity in a close tolerance at least on cylindrical and hemispherical surfaces thereof, said cylindrical plug including at least one flow passage hole disposed therethrough in an oblique angle with respect to the central axis of the cylindrical plug, wherein one opening of the flow passage hole emerges through the hemispherical surface of the hemispherical end of said cylindrical plug;

(c) means for rotating said cylindrical plug; and

(d) means for adjusting seating pressure between the two hemispherical surfaces respectively included in said cylindrical cavity and said cylindrical plug;

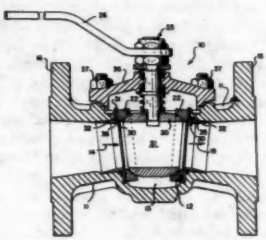
wherein the flow passage hole disposed through the cylindrical plug connects the two flow passages included in the valve body when the cylindrical plug is rotated to a first position, and the cylindrical plug blocks off connection between the two flow passages included in the valve body when the cylindrical plug is rotated to a second position.

4,802,652

TAPERED BALL VALVE

Christopher P. Kaniut, Sulphur Springs, Tex., and Howard R. Dittmer, Buffalo Grove, Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1988, Ser. No. 149,284
Int. Cl.[4] F16K *5/20*
U.S. Cl. 251—181 3 Claims



1. A tapered ball valve comprising:

(a) a valve body having an inner wall defining a valve chamber said chamber having annular inlet and outlet flow openings;

(b) valve seat insert means disposed with said valve chamber, said insert means having a first leg with an inner wall that is coplanar with the inner wall of the body and a second leg that extends outwardly from said valve chamber into its respective flow opening:

(c) sealing means located at the angle enclosed by said first and second legs and between said insert means and said valve body to insure complete sealing of the valve;

(d) valve seat means mounted within said valve seat insert means;

(e) a ball valve member operably disposed within said valve seat means for rotation between flow enabling and flow disabling positions; and

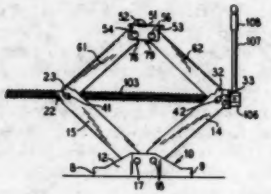
(f) closure means attachable to said valve body to seal said valve chamber and hold said valve seat insert, valve seat and plug valve member in assembled positions.

4,802,653

SCISSORS JACK

Darryl L. Engel, Laotto, Ind., assignor to Universal Tool & Stamping Co., Inc., Butler, Ind.

Filed Nov. 16, 1987, Ser. No. 121,165
Int. Cl.[4] B66F 3/08
U.S. Cl. 254—126 1 Claim



1. A scissor jack comprising, a base member formed with a channel, first and second pivot pins mounted in said base member and extending across said channel, first and second lower links each formed with gear teeth on their inner ends, a first slot formed in the lower surface of said first link, a second slot formed in the lower surface of said second link, said first and second pivot pins receivable into said first and second slots when said gear teeth are in mesh and the lower surfaces of said first and second links make an angle of less than 180 degrees, a cap formed with a channel, third and fourth pivot pins mounted in said cap and extending across said channel, third and fourth upper links each formed with intermeshing gear teeth on their inner ends and pivotally mounted on said third and fourth pivot pins, a fifth pivot pin pivotally connecting the outer ends of said first and third link, a sixth pivot pin pivotally connecting the outer ends of said second and fourth link and means for moving said fifth and sixth pivot pins toward and away from each other so as to raise and lower said jack, wherein a third slot is formed in the upper surface of said third link and a fourth slot is formed in the upper surface of said fourth link and said third and fourth pivot pins are receivable in said third and fourth links when said gear teeth are in mesh and the upper surface of said third and fourth links make an angle of less than 180 degrees, wherein the outer ends of said first, second, third and fourth links are formed with slots into which said fifth and sixth pivot pins are received and said slots at the outer ends of said first, second, third and fourth links are compressed around said fifth and sixth pivot pins, and wherein said means for moving said pivot pins includes a threaded collar mounted on said fifth pivot pin and a thrust bearing is mounted on said sixth pivot pin, and a threaded shaft with one and extending through said thrust bearing and the other end through said threaded collar and a handle for turning said threaded shaft.

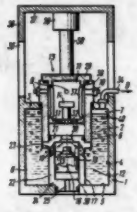
4,802,654

THERMOPULSE APPARATUS FOR DEBURRING PARTS

Valery P. Bozhko; Alexei V. Losev; Mateos P. Takoriants; Viktor I. Pleshkov; Vitaly E. Strizhenko, all of Kharkov; Ivan A. Levityansky, Gatchina; Boris L. Filippov, and Tamara I. Kononenko, both of Kharkov, all of U.S.S.R., assignors to Kharkovsky Aviatsionny Institut, Kharkov, U.S.S.R.

PCT No. PCT/SU86/00040, § 371 Date Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/06513, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 30, 1986, Ser. No. 156,914
Int. Cl.[4] C21D 9/00; B23K 7/06
U.S. Cl. 266—51 1 Claim

1. A thermopulse apparatus for deburring parts comprising a frame having a working chamber (2) provided with spark plugs (9), an inlet valve (10) for filling an interior (11) of the chamber (2) with fuel mixture, an exhaust valve (12) for discharging combustion products from the interior (11) of the chamber (2) and a cover (13) for accommodation of parts (14) being treated being mounted for reciprocations within the chamber (2), characterized in that the frame comprises a hollow body (1), the working chamber (2) is disposed within the body (1) so as to define a space (7) between inner walls (4) of the body (1) and outer walls (6) of the chamber (2) partly filled with a liquid (8), the exhaust valve (12) is mounted in the bottom part of the working chamber (2) to extend along the longituddinal axis (16) under the layer of the liquid (8), the



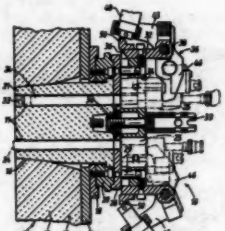
valve (12) having ports (23) in the side walls (22) for establishing communication between the space (7) for the liquid (8) and the interior (11) of the working chamber (2), and the cover member (13) for accommodation of the parts (14) being treated having ports (32) on the side of the exhaust valve (12) for the passage of combustion products from the interior (11) of the working chamber (2) through the inlet port (20) of the outlet valve (12) and its ports (23) in the side walls (22) into the space (7) for the liquid (8).

4,802,655

APPARATUS FOR INJECTING SUBSTANCES INTO LIQUIDS

Kenneth W. Bates, Derbyshire, England, assignor to Injectall Limited, Sheffield, England

PCT No. PCT/GB87/00431, § 371 Date Feb. 15, 1988, § 102(e) Date Feb. 15, 1988, PCT Pub. No. WO88/00246, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 22, 1987, Ser. No. 158,274
Claims priority, application United Kingdom, Jun. 25, 1986, 8615481; Oct. 10, 1986, 8624322
Int. Cl.[4] C21C 5/48
U.S. Cl. 266—218 20 Claims



1. Apparatus for installation in the wall of a liquid containment vessel for injecting substances into a liquid therein, including a refractory block which is pierced by an injection passage, has in injectant delivery pipe therein and has a passage blocking element temporarily located at or in a delivery end of the passage to prevent liquid entering the passage before injection is commenced, the pipe being movable forcibly in the

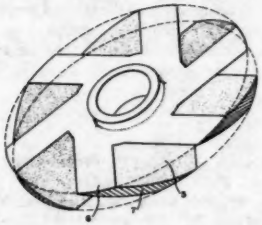
passage at the said element to break or dislodge said element to open the passage for injection, wherein the delivery pipe is part of a lance assembly and wherein positioning means acting between the said assembly and a fixed part of the apparatus define a stop for locating the lance assembly at a ready position prior to injection.

4,802,656

ROTARY BLADE-TYPE APPARATUS FOR DISSOLVING ALLOY ELEMENTS AND DISPERSING GAS IN AN ALUMINUM BATH

Gérard Hudault, Pau, and Pierre Netter, Voiron, both of France, assignors to Aluminium Pechiney, Paris, France

Filed Sep. 17, 1987, Ser. No. 97,880
Claims priority, application France, Sep. 22, 1986, 86 13362
Int. Cl.[4] C22B *21/06*
U.S. Cl. 266—225 9 Claims



1. A rotary blade-type apparatus for dissolving alloy elements and dispersing gas in an aluminium bath comprising a vertical shaft (1) which is pierced along its axis by a duct (2) intended for the passage of the gas, connected in its upper part to a source of gas and to a drive motor and comprising in its lower part which is immersed in the bath a disc (3) with the same axis as the shaft characterised in that the disc is provided on its side wall with blades (4) which extend along the generatrices of a right prism of parallelogrammatic section with its axis passing through the centre of the disc, the ends of which result from the intersection of said prism with a cylinder of the same axis as that bearing against the side wall of the disc, the large faces (5) of the prism forming an angle α of at most 45 degrees to the horizontal and the small faces (6) being disposed respectively in the planes of the upper and lower faces of the disc, said blades being provided with at least one orifice (7) connected to the duct (2) by a tubular passage (8).

4,802,657

VEHICLE LEVELING SHOCK ABSORBER ASSEMBLY

Jan M. A. Wijnhoven; Henri C. J. Vanhove, both of Sint Truiden, and Marc J. I. I. J. Panis, Kessel-lo, all of Belgium, assignors to Monroe Auto Equipment Company, Monroe, Mich.

Filed Jun. 23, 1986, Ser. No. 877,121
Int. Cl.[4] F16F *9/08, 9/50*
U.S. Cl. 267—64.24 44 Claims

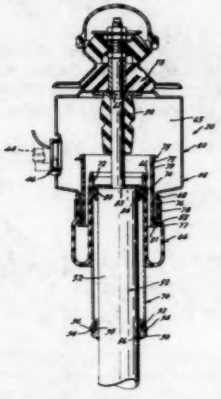
1. A fluid adjustable shock absorber assembly comprising:

a shock absorber having an elongated housing, a piston slidably movable within said housing, a diaphragm support member connected to the outer periphery of said housing and a piston rod attached to said piston and extending longitudinally outwardly from one end of said housing for longitudinal movement relative to said housing;

a generally hollow chamber member generally surrounding at least a portion of said shock absorber and sealingly interconnected with a longitudinally outer end of said piston rod, said chamber member being spaced laterally outwardly relative to said shock absorber, a flexible diaphragm member having a first and second end portion, respectively, sealingly interconnected with said chamber member and said support chamber, said members collectively defining a pressurizable fluid chamber with said piston rod and said housing;

fluid pressure supply means operable for supplying a pressurized fluid to and from said pressurizable fluid chamber;

a generally longitudinally extending hollow coil support tube encircling a portion of said shock absorber in a laterally spaced-apart relationship therewith and having a portion of its outer periphery encircled by a portion of said chamber member, said coil support tube having a



generally laterally extending flange thereon fixedly interconnected with said chamber member,

an electrical coil fixedly attached to said support tube outer periphery and contained in the interior of said chamber member for sensing the longitudinal position of said housing relative to said piston rod, the inductance of said electrical coil varying in response to varying longitudinal positions of said housing relative to said piston rod; and

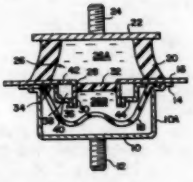
control means for operating said fluid pressure supply means in response to the sensing of the longitudinal position of said housing relative to said piston rod by said electrical coil.

4,802,658

VIBRATION ISOLATING APPARATUS

Takao Ushijima, Chigasaki, and Takeshi Noguchi, Yokohama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 770,236, Aug. 28, 1985, abandoned. This application Dec. 16, 1987, Ser. No. 134,598
Claims priority, application Japan, Sep. 7, 1984, 59-187360
Int. Cl.[4] F16F *15/04;* B60G *15/04;* F16M *13/00*
U.S. Cl. 267—140.1 28 Claims



1. A vibration isolating apparatus disposed between a vibration generating portion and a vibration receiving portion and having a liquid chamber capable of being expanded and con-

tracted, which apparatus comprises a partition member, made of a stretchable resilient material and having a substantially uniform thickness, which divides said liquid chamber into two small liquid chambers and which is disposed so as to be deformable to the maximum deformation limit of the resilient material in response to vibration amplitudes, and an orifice disposed between said small liquid chambers to communicate through small openings therebetween, whereby low-frequency vibrations are absorbed by virtue of fluid resistance occurring in said orifice, while high-frequency, vibrations are absorbed by virtue of deformation of said resilient partition member which suppresses rises in pressure inside said liquid chamber.

4,802,659

LEAF SPRING

Stephen A. Hope, Sunbury-on-Thames, England, assignor to British Petroleum Company p.l.c., London, England

Filed Jul. 13, 1987, Ser. No. 72,638

Claims priority, application United Kingdom, Jul. 17, 1986, 8617540

Int. Cl.[4] B60G *11/02*; F16F *1/36*

U.S. Cl. 267—149 **12 Claims**

1. A leaf spring of fibre reinforced composite material for attachment to the wheel axle of a vehicle for reducing local stresses when the leaf spring is under load, said spring comprising a longitudinal, vertical cross-section having a central zone and two end zones, the central zone being clamped to said axle with the spring ends attached to the vehicle chassis, the central zone being thicker than the end zones, said longitudinal, vertical cross-section further having a tapered zone between the central zone and each of the end zones, the tapered zone having upper and lower curved surfaces, each curved surface comprising a first convex portion and a second concave portion, the convex portion being adjacent to the central zone and the concave portion being adjacent to the end zone, and each convex and concave portion being a segment of a curve which is defined by x and y axes of the longitudinal, vertical cross-section of the spring, wherein the x axis is the longitudinal axis of the spring and the y axis is perpendicular to the x axis and is in the plane of the vertical cross-section and where P is defined as the length in the x axis of the segment of the curve and h is defined as the length in the y axis of the segment of the curve, and the curve is defined by the mathematical equation

$$(X/A)^C+(Y/B)^D=1$$

wherein X and Y are displacements in the x and y axes respectively and A is defined as the solution to the mathematical equation

$$(P/A)^C+((B-h)/B)^D=1$$

where B, C and D are arbitrary numbers selected to define the path of an ellipse in space.

4,802,660

ELECTRICALLY CONTROLLED SPRING ELEMENT

Göran Engdahl, Täby, Sweden, assignor to Asea Brown Boveri AB, Västerås, Sweden

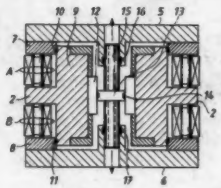
Filed Mar. 15, 1988, Ser. No. 168,417

Claims priority, application Sweden, Mar. 19, 1987, 8701138

Int. Cl.[4] F16F *6/00*

U.S. Cl. 267—182 **3 Claims**

1. An electrically controlled spring element comprising an even number of elements in which each element consists of a rod of highly magnetostrictive material, permanent magnets to pre-magnetize the rod and a surrounding excitation coil and that the elements form a basic spring element comprising two elements mounted in a frame, the rods being in line, having the same centre line and with an intermediate transmission element having a power output, and that the magnetic orientation of



the pre-magnetization and the excitation coils are so arranged that, regardless of the direction of the control current, they are directed in the same direction in one element and in opposite directions in the other element and that the electrically controlled spring element consists of one or more basic spring elements.

4,802,661

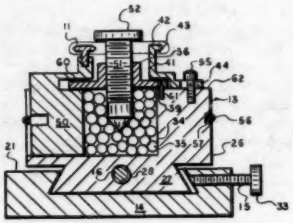
METHOD AND APPARATUS FOR PRODUCING EYEGLASS FRAMES

Bryce D. Jewett, Sr., 2901 Maury St., Richmond, Va. 23224

Filed Jan. 20, 1988, Ser. No. 145,892

Int. Cl.[4] B23Q *3/14*

U.S. Cl. 269—48.1 **7 Claims**



1. An apparatus for holding a plastic workpiece panel of elongated outer periphery for the production of an eyeglass frame, said panel having two lens-holding apertures of mirror image identity substantially centered upon the axis of elongation of the panel, each aperture having a groove circumscribing its entire perimeter centered within the thickness of the panel and adapted to receive the edges of the lenses which will be inserted into the finished frame, said apparatus comprising:

(a) a rigid base having means for attachment to an underlying substrate,

(b) paired chuck assemblies of mirror image identity slideably positionable upon said base along a common horizontal axis,

(c) means for causing sliding motion of said chuck assemblies upon said base,

(d) means for locking each chuck assembly in a desired location upon said base,

(e) each chuck assembly comprising:

(1) a housing having a lower portion which engages said motion causing means, an upper portion having a chamber which confines a multitude of ball bearings, said chamber having an upwardly directed opening, a cylindrical threaded hub disposed above said opening and having a hollow interior that communicates with said

chamber, and slots oriented in vertical planes radially emergent from said chamber,

(2) first holding means laterally positionable in a direction perpendicular to said common horizontal axis and adapted to engage the groove within an aperture of said workpiece panel,

(3) second holding means adapted to engage the groove within an aperture of said workpiece panel at a site closest to the other aperture, said site ultimately becoming the nosepiece of the eyeglass frame, the concerted action of the second holding means of the two chuck assemblies being to limit the separation between the two assemblies against the urging of said means for causing sliding motion along said horizontal axis,

(4) a number of impingement means moveable radially with respect to said hub, and adapted to contact the workpiece panel at different sites within the apertures thereof, each impingement means being supported by an underlying traveling plate communicating with said chamber and constrained to slide within said slots, and

(5) closure means which treadably engages said hub and, by rotation moves downward to apply force to the multitude of ball bearings, whereby

(f) said traveling plates are independently driven radially outwardly from said hub, carrying said impingement means which abut with equal force against the perimeter of the aperture, whereby

(g) the workpiece panel is securely and precisely held without distortion in a manner to permit milling of its outer periphery to produce the sought eyeglass frame.

4,802,662

PROCESS AND DEVICE FOR REMOVING THE TOP PLY FROM A STACK OF PLIES SUCH AS LAYERS OF FABRIC

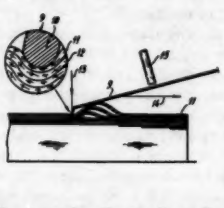
Hendrik J. H. Hobbelt, Almelo; Eduard A. Burgemeister, Sprang/Capelle, and Theodorus J. P. M. Kroon, Aalten, all of Netherlands, assignors to Research-Vereniging Nededlandse Kleding-En Tricotage-Industrie(RNKT), Netherlands

Filed Sep. 2, 1986, Ser. No. 902,608

Claims priority, application Netherlands, Sep. 2, 1985, 8502400

Int. Cl.[4] B65H *3/60*

U.S. Cl. 271—20 4 Claims



1. A process for removing the top layer from an elastically compressible stack of layers of fiber material by having an element engage the top layer of the stack and move said element in the plane of said top layer, the improvement being that the element engages the top layer with a smooth surface which has a friction upon said top layer which is less than the friction between the top layer of the stack and the next layer below the top layer, which element is pressed upon the stack in such a way that the stack is locally dented, in which position the element is moved over in pressing contact with the stack from an initial position on top of the stack towards an edge of the stack, after which the element is returned free from said top layer, while a vacuum is produced above the top layer by means of a jet of air directed onto a plate arranged with an upward inclination with respect to the element in the direction of said edge in such a way that the top layer is lifted by the vacuum.

4,802,663

SHEET SMOOTHER FOR THE GRIPPED EDGE OF THE SHEET IN A SHEET-FED ROTARY PRINTING MACHINE

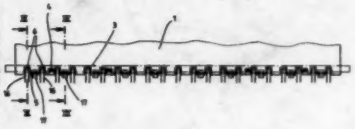
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to MAN-Roland Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,414

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521590

Int. Cl.[4] B65H *9/18*

U.S. Cl. 271—227 8 Claims



1. A sheet smoother for a sheet-fed rotary printing machine having a sheet feeder with

a feed table (1) having a feeding edge and adapted to support a plurality of sheets (2); and

grippers (16) and front gauges (17) disposed along the feeding edge of said table (1);

comprising

a vertically reciprocable beam-shaped rule (3) disposed above said feed table (1), extending perpendicularly to sheet-feeding direction and located adjacent the feeding edge of the sheet when the sheet is positioned against the front gauges (17), said rule being formed along one edge with a plurality of transversely extending recesses (5, 6), located immediately adjacent to, and adapted for receiving, said grippers (16) and front gauges (17);

a lifter (7) supporting said rule (3); and

means for raising said lifter (7) and said rule (3) during removal of a sheet (2) by said grippers (16) from said table (1) and for subsequently lowering an axially continuous portion of an undersurface of said rule (3) onto a following sheet, for smoothing the entire width of the leading edge of said following sheet (2) on said table (1).

4,802,664

ARRANGEMENT FOR THE FEEDING OF SHEETS TO A MAGAZINE

Arild Larsen, Rabbalshede, Norway, assignor to AB Tetra Pak, Lund, Sweden

Filed Jan. 6, 1987, Ser. No. 843

Claims priority, application Sweden, Jan. 20, 1986, 86002233

Int. Cl.[4] B65H *29/18*

U.S. Cl. 271—201 7 Claims

1. An apparatus for feeding sheets or blanks to a stacking magazine comprising:

a guide located next to the magazine,

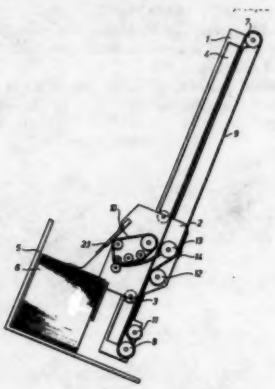
a carriage movable along the guide,

an endless driving belt extending along the guide,

feed-out means for feeding-out sheets entering the carriage to the magazine, said feed-out means including an endless feed-out belt which is supported by the carriage and which includes an active section extending in a direction toward the magazine, said active section of the feed-out belt extending along a guide rail directed toward the magazine, said feed-out means further including a feedout pulley around which said feed-out belt is guided at a downstream end of said active section and a feed-out roll spaced from said feed-out belt by a distance, in a non-loaded condition, adapted to be less than the thickness of a sheet to be fed to the magazine, and

drive means connected between the driving belt and the carriage for driving the carriage along the guide and for

driving the feed-out means, the drive means including a first pulley which delivers drive to the feed-out means by



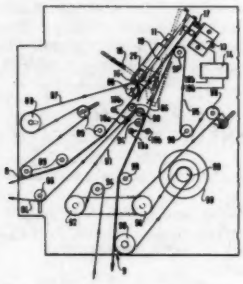
rotating and which delivers drive to the carriage by frictionally engaging the driving belt.

4,802,665

CONVEYOR DEVICE FOR FLAT OBJECTS

Roland Allio, La Roche de Glun; Raymond Chifflet, Grandes les Valence, and Phillipe Jeantin, Valence, all of France, assignors to Compagnie Generale D'Automatisme CGA-HBS, Paris, France

Filed Jul. 29, 1987, Ser. No. 78,955
Claims priority, application France, Jul. 29, 1986, 86 10970
Int. Cl.[4] B65H *5/00*
U.S. Cl. 271—225 **9 Claims**



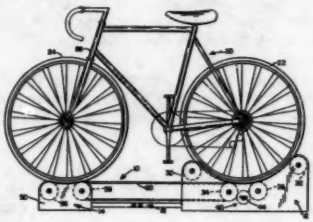
1. A conveyor device for flat objects, comprising a substantially linear input conveyor having an object input and an object output, a substantially linear output conveyor orthogonal to said input conveyor and having an input and an output, the input of said output conveyor being substantially contiguous with the output of said input conveyor, a U-shaped chute, pivotably mounted on said conveyor device, for linking said input and output conveyors, said chute having an object input-/output end and being pivotable between an idle position in which it extends the output of said input conveyor and a transfer position in which it extends the input of said output conveyor, said chute further including a roller partially projecting thereinto from one side thereof, said roller being substantially aligned with the output of said input conveyor when said chute is in said idle position and substantially aligned with the input of said output conveyor when said chute is in said transfer position, said chute also having a high side from which said roller projects and a low side below a level of said output conveyor, said output conveyor including an ejector belt extending beyond the input of said output conveyor and partly into said chute when in said transfer position, in which said roller is pressed against said ejector belt, said conveyor device further comprising control means for moving said chute between said idle and transfer positions.

4,802,666

BICYCLE SUPPORT APPARATUS

Michael Rodriguez, 2499 Kapiolani Blvd., Apt. 3100, Honolulu, Hi. 96826

Filed Aug. 6, 1987, Ser. No. 82,312
Int. Cl.[4] A63B *69/16*
U.S. Cl. 272—73 **4 Claims**



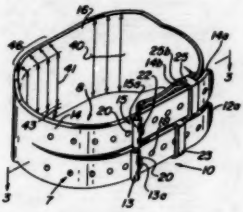
1. A bicycle support for supporting through its wheels an assembled bicycle for non-traveling, exercise use of the bicycle comprising:

a front wheel support assembly including a frame and at least a pair of laterally spaced rollers journaled on said frame for rotation about parallel axes, the rollers having wheel-engaging surfaces and the surfaces of the rollers lying in a first circular arc, the rollers being constructed and arranged to provide for cradled support therebetween of the front wheel of the bicycle,

a rear wheel support assembly including a frame and multiple laterally spaced rollers journaled on said frame for rotation about parallel axes, the rollers of the rear wheel support assembly having wheel-engaging surfaces and these surfaces lying in a second circular arc having the same radius as said first circular arc, said rollers of the rear wheel support assembly including a front roller and rear roller and at least an intermediate roller between the front and rear rollers, the front and rear rollers being constructed and arranged to provide for cradled support therebetween of the rear wheel of a bicycle and the intermediate roller providing a bottoming support between the cradled support for the rear wheel, the surfaces of said front and rear rollers being angularly spaced in said second circular arc a greater angular distance than the angular spacing of the surfaces of the rollers in the front wheel assembly in said first circular arc, belt means interconnecting the intermediate roller in the rear wheel support assembly with a roller in the front wheel support assembly whereby rotation is imparted from the intermediate roller to the roller in the front wheel support assembly, and

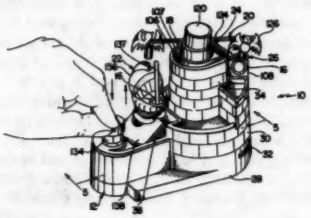
means fixing the front and rear wheel assemblies at a predetermined distance apart and with the assemblies aligned in a direction extending transversely of their respective rollers.

4,802,667
WEIGHTLIFTER'S BELT
David J. Altner, 2415 Ridge Rd., Perkasie, Pa. 18944
Filed Feb. 8, 1988, Ser. No. 153,314
Int. Cl.[4] A63B 13/00
U.S. Cl. 272—123 5 Claims



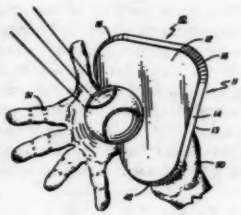
1. A belt arrangement for use in the practice of weightlifting comprising:
(a) a flexible member which is integrally formed to provide first and second contiguous belts which respectively include tongue and buckle members, said first belt being utilized with respect to the narrowest dimension of the waist;
(b) a plurality of holes formed in said respective first and second belts wherein the holes in the first belt are staggered with respect to the holes in the second belt for allowing each to develop equal tension in the waist area with respect to one another and full tension across the lumbar region when said respective buckles and tongues are tightened around the weightlifter's waist;
(c) first and second loop members wherein a respective first loop is attached to said first belt and said second loop is attached to said second belt, and wherein said first loop is positioned closer to the buckle associated with the first belt than is the buckle associated with the second belt to prevent interference with one another and to prevent a gap from being formed between the belts.

4,802,668
TOY GAME APPARATUS
Toshio Kobayashi, Chiba, Japan, assignor to Asahi Corporation, Tokyo, Japan
Filed Dec. 7, 1987, Ser. No. 129,822
Claims priority, application Japan, Dec. 6, 1986, 61-188014
Int. Cl.[4] A63F 9/00
U.S. Cl. 273—1 GE 9 Claims



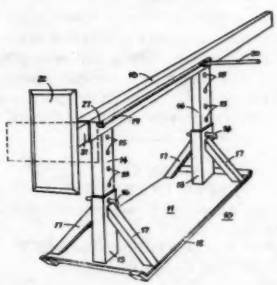
1. An action toy game apparatus comprising a base, a timer in said base actuatable for a set period of time, a plurality of magnetically responsive game elements, feeder means for sequentially feeding said game elements to a feeder station, magnetic support means on said base communicating with said timer and rotating when said timer is in an actuated condition, said magnetic support means being operative for individually receiving sequential game elements from said feeder means at said feeder station and for magnetically supporting them so that they are individually moved in a substantially circular path which is spaced upwardly from said base, and retrieving means on said base for individually retrieving said game elements from said support means as they are moved in said substantially circular path.

4,802,669
BASEBALL TRAINING DEVICE
Peter C. Birmingham, 117 Pumpkin La., Syracuse, N.Y. 13219
Filed Oct. 13, 1987, Ser. No. 107,559
Int. Cl.[4] A63B 71/02
U.S. Cl. 273—26 C 4 Claims



1. A baseball training device that is worn over the glove hand of a player to aid the wearer in developing good fielding skills that includes a triangular shaped uniformly resilient pad having planar front and back surfaces, said pad having hand attachment means on the back surface thereof for encircling the thumb and first three fingers of the glove hand which will align the middle finger along an axis of the triangle with the apex of the pad being positioned over the wrist, the edge of the pad extending outwardly beyond the tips of the fingers and side edges of the user's hand, said pad having a resilience such that when worn on the hand of a player a ball striking said front surface backed by a wearer's hand heel portion will deform to a greater extent than the remaining portion of the pad and will have a longer surface contact time on said pad than balls striking the remaining portion of said pad whereby a wearer is afforded greater time in which to place his other hand over a ball when making a catch.

4,802,670
FOOTBALL BLOCKING APPARATUS
Dan R. Smith, 6733 Fernwood Dr., Boise, Id. 83709
Filed Feb. 18, 1987, Ser. No. 16,017
Int. Cl.[4] A63B 67/00
U.S. Cl. 273—55 R 3 Claims



1. A football blocking apparatus which comprises:

an outer tubular frame member and an elongated ram member;

a support means for holding the outer tubular frame member in parallel spaced relationship to the ground;

said outer tubular frame member telescopically receiving and supporting said ram member;

a blocking pad simulating a torso of an on-rushing defensive lineman attached to the extending end of said telescoping ram member;

means for receiving a force from a trainer for selectively and repeatedly extending the blocking pad to simulate the forward rush of a defensive lineman;

means for adjusting the height at which the outer tubular frame member is held in parallel spaced relationship to the ground;

said outer tubular frame member having an elongated slot therein, said slot being parallel to and horizontally extending with respect to the longitudinal axis of said tubular frame member; a thrust bar attached to and extending horizontally from said telescoping ram member through said slot for selectively and repeatedly receiving thrust forces from a trainer to selectively extend and retract said telescoping ram member relative to said outer frame member to simulate the repeated rush of a defensive lineman.

4,802,671

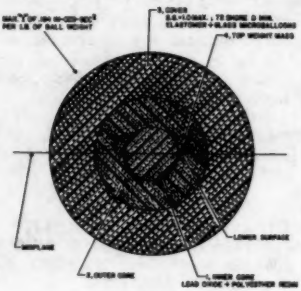
BOWLING BALL

Joseph A. Gentilsomo, 1456 Belmont Ave., Schenectady, N.Y. 12308

Continuation-in-part of Ser. No. 628,158, Jul. 5, 1984, which is a continuation-in-part of Ser. No. 171,897, Jul. 24, 1980, abandoned. This application Aug. 11, 1987, Ser. No. 83,811

Int. Cl.[4] A63B *37/14*

U.S. Cl. 273—63 E **14 Claims**



1. A bowling ball comprising:

(a) an inner core having its center substantially coincident with the geometrical center of said bowling ball;

(b) a solid outer core surrounding said inner core;

(c) and a rigid elastomer foam cover surrounding said outer core, and having a minimum Shore D Durometer hardness of 72 and a maximum specific gravity of 1.

4,802,672

SET OF GOLF IRONS

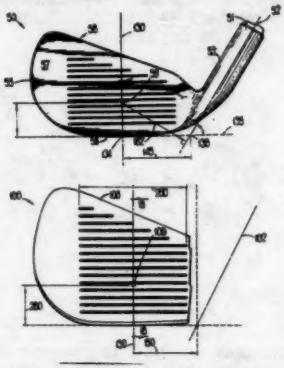
D. Clayton Long, Albany, Ga., assignor to MacGregor Golf Company, Albany, Ga.

Filed Jun. 24, 1987, Ser. No. 66,077

Int. Cl.[4] A63B *53/00*

U.S. Cl. 273—77 A **4 Claims**

1. In a set of golf irons consisting of long irons and short irons wherein each iron has a head with a heel, a toe, a sole, a planar face, a backside, a top, a center of mass, and a hosel and wherein each iron has an offset and the set has progressively decreasing offset from the long irons to the short irons, the



improvement comprising a progressively decreasing displacement from the long irons to the short irons.

4,802,673

PUZZLE GAME

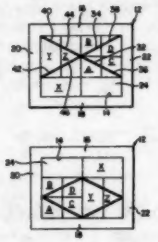
Narendrakumar M. Patel, 59 Deerfield Rd., Parsippany, N.J. 07054

Continuation-in-part of Ser. No. 926,964, Nov. 4, 1986, Pat. No. 4,732,388. This application Jan. 29, 1988, Ser. No. 149,855

The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

Int. Cl.[4] A63F *9/08*

U.S. Cl. 273—153 S **20 Claims**



1. A puzzle comprising:

a frame comprising opposed first and second major sides and opposed first and second minor sides extending between and connected to the major sides so as to define a generally rectangular opening in said frame, said rectangular opening having a major dimension measured parallel to said major sides and substantially equal to four times a selected unit of measurement, and a minor dimension measured parallel to said minor sides and being substantially equal to three times the selected unit of measurement such that a line connecting the midpoints of said major sides defines first and second halves of said opening adjacent the first and second minor sides respectively;

four substantially identical square puzzle pieces having side edges equal in length to the selected unit of measurement, said square puzzle pieces being movable within the rectangular opening of said frame and being initially disposed in the first half of the rectangular opening; and

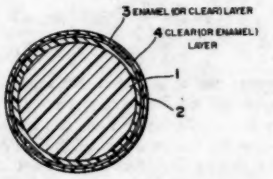
three substantially identical rectangular puzzle pieces, each said rectangular puzzle piece having a minor side dimension substantially equal to the selected unit of measurement and a major side dimension substantially equal to twice the selected unit of measurement, said rectangular puzzle pieces being movably disposed within said rectangular frame, two of said rectangular puzzle pieces having

their major sides parallel to the minor sides of the frame and being initially disposed entirely within the second half of the opening therein, the remaining rectangular puzzle piece having its major side parallel to and adjacent one of said major sides of said frame, at least selected ones of said square and rectangular puzzle pieces having indicia thereon, whereby said square and rectangular puzzle pieces can be moved relative to said frame to achieve a selected distribution of said square and rectangular puzzle pieces such that said square puzzle pieces are entirely within the second half of said opening and the parallel rectangular puzzle pieces are entirely within the first half of the opening.

4,802,674
GOLF BALL

Katsutoshi Kitaoh, Takarazuka, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Mar. 17, 1987, Ser. No. 26,888
Claims priority, application Japan, Mar. 17, 1986, 61-39155
Int. Cl.[4] A63B *37/12*
U.S. Cl. 273—235 A **13 Claims**

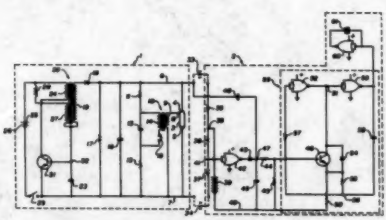


1. A golf ball prepared by coating a golf ball core with an ionomer resin composition comprising 0.5 to 10% by weight of a pigment and 0.2 to 0.6% by weight of a fluorescent whitening agent, wherein the % of the pigment and the agent are based on the total weight of the resin composition and then coating the ionomer resin composition coated golf ball core with an enamel paint comprising 1 to 10% by weight of a pigment, wherein the % is based on the solid content of said enamel paint.

4,802,675
TOY GUN

David L. W. Wong, 1040 West 55 Avenue, Vancouver, British Columbia, Canada (V6P 1R1); Paul C. P. Leung, 3590 Osler Street, Vancouver, British Columbia, Canada (V6H 2W6), and Friederich H. Spisslnger, 3343 West Broadway, Vancouver, British Columbia, Canada (V6R 2B1)

Filed Sep. 24, 1986, Ser. No. 911,148
Claims priority, application United Kingdom, Jan. 20, 1986, 8601299
Int. Cl.[4] A63H *33/26*
U.S. Cl. 273—310 **28 Claims**

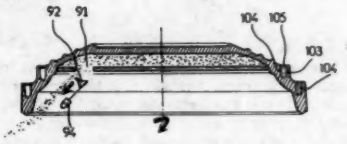


1. A game comprising a toy gun, including an electronic flash tube; means to provide a relatively low-voltage direct current supply; means to produce from the low-voltage supply a relatively high-voltage unidirectional supply; means coupled to the high-voltage supply to fire the flash tube in response to pressure on a trigger of the gun; and a reflector positioned adjacent the flash tube to produce a beam of light; and a hollow concentrator having a relatively large diameter inlet into which the beam passes, and a relatively small diameter outlet which serves to concentrate the beam into a relatively narrow beam for projection at a target.

4,802,676
CLAY PIGEON HAVING AT LEAST ONE SEALED RECESS CONTAINING A PRODUCT PRODUCING A CLOUD PERMITTING VISUALIZATION IN SPACE OF THE IMPACT AND/OR DURING FLIGHT

Rene Descos, Uchaud, and Jean-Claude Laporte, Biot, both of France, assignors to Cibles Descos S.A.R.L., Vauvert, France

Filed Jul. 30, 1986, Ser. No. 890,727
Claims priority, application France, Aug. 1, 1985, 85 11930; Jun. 18, 1986, 86 08889
Int. Cl.[4] F41J *9/16, 1/16*; F42B *11/16*
U.S. Cl. 273—363 **2 Claims**

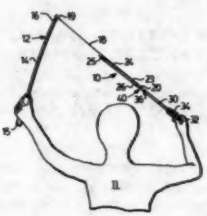


1. In a flying target comprising a target body having a recess therein, means closing said recess to define with said target body a sealed chamber, and an indicating material in said sealed chamber, the improvement comprising a hole extending between said chamber and the outside of the target and means temporarily sealing said hole, said temporary sealing means being adapted to be dislodged from said hole during launching or flight of said target, thereby to discharge a stream of said indicating material through said hole during flight of said target, said temporary sealing means comprising a weight suspended therefrom, such that rotation of said target during flight imparts centrifugal force to said weight and removes said temporary sealing means.

4,802,677
GAME ARROW

Jerald M. Homan, 343 Oakwood Ave., East Peoria, Ill. 61611

Filed Sep. 24, 1987, Ser. No. 100,408
Int. Cl.[4] F41B *15/00*
U.S. Cl. 273—416 **4 Claims**



1. A game arrow, for use with a launching device providing an elongated substantially rigid somewhat flexible stick having a handle end and an opposite distal end with an elongated string attached thereto with the string having an opposite knotted end, comprising;

a two-piece shaft having a forward portion providing a forward end and an opposite connector end, and a rear-

ward portion providing a finger gripping end and an opposite connector end;

and an elongated ferrule having opposite ends rigidly interconnecting said connector ends of the shaft and a mid-portion provided with opposite flats with opposite peripherally curved segments therebetween;

and a slot extended inwardly of the ferrule through one of said segments between said flats of a width slideably to receive said string therethrough with said knotted end of the string engageable with one of said flats.

4,802,678

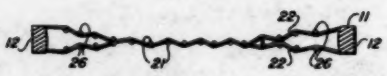
SPORTS RACKET

Rodney A. Svoma, 1210 E. Northern, Phoenix, Ariz. 85020

Filed Feb. 3, 1986, Ser. No. 825,541

Int. Cl.[4] A63B *51/06*

U.S. Cl. 273—73 D 3 Claims



1. In a sports racket comprising a frame having sides connecting a tip and a heel, a handle with a grip thereon secured to the heel of the frame, a plurality of longitudinal strings in said frame and extending generally parallel to said handle and a plurality of transverse strings in said frame and extending generally at right angles to said handle, the improvement wherein a plurality of said longitudinal strings in a middle region of said frame have their ends secured to said frame in such a manner that the strings lie generally from the heel to the tip of the frame in a common flat plane coextensive with the plane of said frame, a plurality of said longitudinal strings to either side of said middle region of said frame being provided in pairs with each pair positioned in a plane generally at right angles to said common flat plane, said pairs of longitudinal strings having their ends secured to said frame in such a manner that the distance between the strings in each pair becomes progressively greater and the strings of each pair are farther from said common flat plane from the string pairs adjacent said middle region to the string pairs adjacent the sides of the frame, said transverse strings being positioned individually in spaced relationship generally from the heel to the tip of the frame, every other transverse string being interwoven only with but one of the strings of the pairs of longitudinal strings to either side of said middle region of said frame, the other transverse strings being interwoven only with the other strings of the pairs of longitudinal strings to either side of said middle region of the frame, and each transverse string being separately interwoven with all of the longitudinal strings in said middle region of the frame.

4,802,679

BELL SEAL OF IMPROVED STABILITY FOR HIGH PRESSURE TURBINES

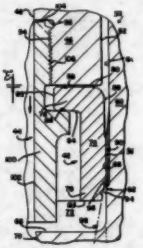
Shun Chen, and Chin-Sheng Lee, both of Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1987, Ser. No. 140,066

Int. Cl.[4] F16J *15/00*

U.S. Cl. 277—12 6 Claims

1. A bell seal assembly comprising, in combination, a bell seal unit and a retaining nut unit, said bell seal unit including a radially inwardly extending flange with an upper end face sealing surface, a lower seal flange support surface, and a generally cylindrical skirt portion depending from said flange and terminating in a skirt end surface, said skirt portion being adapted to be positioned in telescoping relation within a portion of an associated nozzle chamber, said nozzle chamber portion including a cylindrical sidewall sealing surface, said skirt portion having its outer surface subdivided into an upper skirt surface, an intermediate portion and a lower skirt margin, said intermediate portion comprising a primary skirt seal region having at least one circumferentially extending, continuous cylindrical sealing land portion of enlarged diameter relative to said upper skirt surface, said lower skirt margin being tapered inwardly toward and joining said skirt end surface, said lower skirt margin also including a plurality of spaced apart, circumferentially extending grooves, one of which terminates adjacent the lower eged of said sealing land, said sealing land being adapted in use to be spaced closely apart by no more than a working clearance from said sidewall sealing surface of said nozzle chamber when said seal is at a given,



lower temperature and to be urged into snug radial sealing engagement with said sidewall sealing surface of said nozzle chamber when said nozzle chamber and said seal unit are at an elevated temperature, said bell unit being positioned by said retaining nut for free but limited axial movement such that said upper end face sealing surface is spaced just apart from a cooperating bottom end face sealing surface on an associated inlet sleeve, but is movable to a position of end face engagement with said inlet sleeve lower end face surface in response to an increase in fluid pressure in the interior of said seal assembly.

4,802,680

COAXIAL COLLET CHUCK

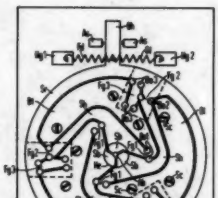
Volker Fuchs, Ottobrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 4, 1987, Ser. No. 21,793

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609723

Int. Cl.[4] B23B *31/02*

U.S. Cl. 279—33 12 Claims



1. In a coaxial collet chuck having at least two clamping jaws adjustable and moveable in common in a radial direction, and means for moving the jaws radially, the improvement comprising:

said means including a separate chuck lever (Sh) connected

to each of said clamping jaws (Sb) at a point intermediate the ends of each of said chuck levers (Sh);

said chuck levers (Sh) each being connected to a respective stationary base part (Bt) by a first spring joint (Fg1) on a first end of each of said chuck levers;

said chuck levers (Sh) each being hinged to a set collar (Sr) by a second spring joint (Fg2) for common clamping and releasing of said clamping jaws (Sb) on a second end of each of said chuck levers opposite said first end;

said set collar (Sr) being respectively rotatably seated at each of said stationary base parts (Bt) by a third spring joint (Fg3);

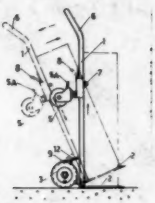
whereby all of said chuck levers (Sh), stationary base parts (Bt), first, second and third spring joints (Fg1, Fg2, Fg3) as well as said set collar (Sr) are fashioned of one piece from a common plate.

4,802,681

WHEELBARROW

Tung-Ping Hung, No. 14 Lane 590 Hsin-Fu Road, Feng-Shan Kaohsuing, Taiwan

Filed Dec. 17, 1987, Ser. No. 134,483
Int. Cl.[4] B62B 3/02
U.S. Cl. 280—47.18 2 Claims



1. An improved wheelbarrow capable of being used as a two-wheeled and a four-wheeled device which comprises:

a body having a front section, an axis bar and a rear section, the rear sections having a handle including pipes; the front section including pipes, two front wheels and two rear wheels each rotatably mounted on the front section pipes, and braking devices for the two front wheels; the pipes of the front and rear sections each having one end pivotally attached to the axis bar,

a folding device for permitting the push handle of the front section to pivot about the axis bar, the folding device including controlling blocks arranged in the one end of the pipes of the front section, movable blocks and springs arranged within the one end of the pipes of the handle so that the springs force the movable blocks against the controlling blocks in an engaging relationship, and a pulling stick arranged to release the force of the springs, so that the movable blocks and controlling blocks can be disengaged and the push handle can be pivoted to at least one of three positions including a first position of the push handle being an extension to the front section when the wheelbarrow is used as the two-wheeled device, a second position of the push handle being vertical to the front section when the wheelbarrow is used as the four-wheeled device, and a third position of the push handle being folded on the front section for storage of the wheelbarrow, and

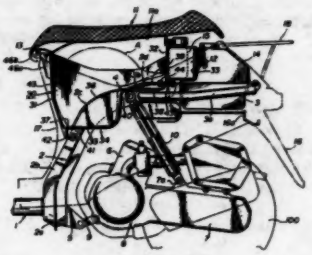
a rack for one of loading and unloading arranged on the front section at an end opposite the folding device.

4,802,682

STORAGE DEVICE ON MOTORCYCLE

Kitasei Yasuji, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1987, Ser. No. 89,159
Claims priority, application Japan, Sep. 29, 1986, 61-149298
Int. Cl.[4] B62J 7/02
U.S. Cl. 180—219 19 Claims



10. A storage device on a motorcycle having a body frame including a rear frame member extending substantially longitudinally centrally of said body frame and being upwardly inclined rearwardly from a lower position to an upper position below a driver's seat, said storage device comprising:

a container disposed below said driver's seat and having a bottom wall,

a bulging portion in said bottom wall defining a substantially longitudinally extending recess to receive said rear frame member, and

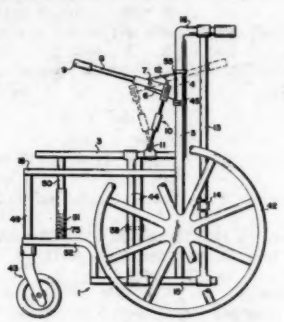
substantially upstanding wall means extending upwardly from said bottom wall about the periphery thereof, said wall means having an opening at the upper end thereof beneath said driver's seat.

4,802,683

WHEELCHAIR WIDTH REDUCING ATTACHMENT

J. T. Gillum, Sr., 4418 NW. 32nd Ave., Gainesville, Fla. 32606

Continuation-in-part of Ser. No. 931,332, Nov. 13, 1986, abandoned. This application Aug. 10, 1987, Ser. No. 82,905
Int. Cl.[4] A47C 4/00
U.S. Cl. 280—304.1 17 Claims



1. A width reducing attachment for a wheelchair which comprises a pair of side frame members pivotally connected to each other for movement toward and away from each other and seat support members connected to said side frame members in a manner to cause movement of said side frame members toward and away from each other when said seat support members are respectively raised and lowered vertically with respect to said side frame members; said width reducing attach-

ment comprising means operable by the occupant of the wheelchair or by an attendant to raise said seat support members with respect to respective adjacent side frames, said means including an operating lever pivotally connected near one end to said adjacent side frame, said operating lever having a hand grip portion at its other end and being readily moveable without detachment from said adjacent side frame from a position in which its said other end lies forward of the pivotable connection and is accessible for operation by the occupant of the wheelchair to a position in which its said other end lies to the rear of the pivotable connection and is readily accessible for operation by an attendant standing behind the wheelchair.

4,802,684

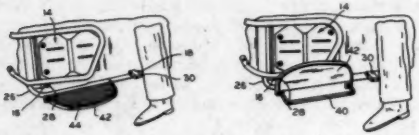
MOTORCYCLE FLOORBOARD DEVICE

William R. Bennett, 14317-139th Ave. Ct. West, Edgington, Ill. 61284; Tom Mix, 8216 50th St., Coal Valley, Ill. 61240, and James F. Smith, 4102 8th Ave., Moline, Ill. 61265

Filed Dec. 17, 1982, Ser. No. 450,977

Int. Cl.[4] B62J *25/00*

U.S. Cl. 280—291 **5 Claims**



1. An accessory device for attachment to a motorcycle of a type having a roll bar associated with at least its motor, said accessory device comprising means including an elongated support frame to be attached at one end to said motorcycle at a motor mount location and at the other end to a foot peg location near the back of the motorcycle, said support frame providing means for resting and supporting the foot of a motorcycle rider on a pivoted pad, said elongated support frame having mounting means disposed on opposite ends of the elongated frame, said mounting means being shaped and dimensioned to be attached to said motorcycle by fitting under existing bolts at said motor mount location and at said foot peg location on said motorcycle, and said pivoted foot pad means hingedly affixed to said support frame to pivot between a horizontal position for use and a vertical position for out-of-the-way storage.

4,802,685

WINCH ASSEMBLY FOR USE WITH A BOAT TRAILER OR THE LIKE

Byron L. Godbersen, Lake LaJune Estates, Ida Grove, Iowa 51445

Division of Ser. No. 112,476, Oct. 26, 1987. This application Mar. 31, 1988, Ser. No. 176,211

Int. Cl.[4] B60P *3/10*

U.S. Cl. 280—414.1 **2 Claims**

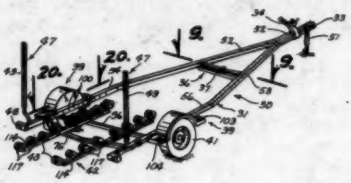
1. A winch assembly for use with a boat trailer having a tongue at the front end thereof, said which assembly comprising:

winch means adapted to rotatably mount a cable for removable attachement to a boat to be movably mounted onto the boat trailer; and

stand means adjustably mounted on the tongue and movable between an upright position and a position tilted toward the rear end of the boat trailer, said stand means supporting said winch means;

and wherein said stand means comprises a channel shaped member having a bottom portion adapted to straddle the tongue;

and further wherein said member has a pair of transversely aligned first openings formed forwardly in the bottom portion for receiving a connecting element therethrough,



and said member having further a pair of transversely aligned, plurality of second openings formed rearwardly in the bottom portion and also formed in an upwardly, rearwardly curving arc, said second openings spaced apart, each transversely aligned pair of second openings adapted to receive a second connecting element.

4,802,686

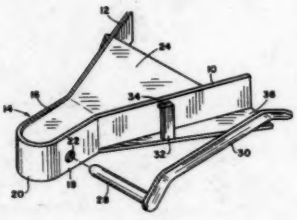
TRAILER HITCH

Noah D. Isreal, 201 Kansas St., Pawnee, Okla. 74058

Filed Oct. 30, 1987, Ser. No. 115,535

Int. Cl.[4] B60D *1/06*

U.S. Cl. 280—477 **6 Claims**



1. A trailer hitch for use with a hitch ball which comprises:

an elongated hitch ball receiving compartment having first and second substantially parallel sections having upper and lower edges which sections are connected by a curved section having an upper and a lower edge, the parallel sections forming a mouth between the end of said first and second section at a position opposite the curved section;

a third and fourth section each having an upper and a lower edge and which connect to the first and second section respectively at said mouth and flare outwardly, said mouth being unobstructed so that said hitch ball may pass therethrough;

a top plate extending along the top edges of said curved section, said first and second sections and said third and fourth sections;

a U-shaped plate secured to the lower edge of said first section, said second section and said curved sections and a first hole through said first section and a second hole through said second section said U-shaped plate extending on the inner side of said first section, said second section and said curved section forming a V-shaped ledge inside thereof with a throat width which is less than the diameter of said hitch ball;

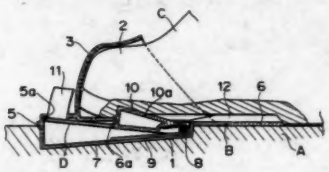
a pin lock lever having a handle and a pin in which the pin is insertable through said first and second holes.

4,802,687

SKI SHOE BINDING DEVICE

Satoshi Shimizu, Tokyo, Japan, assignor to Northern Commercial Limited, Tokyo, Japan

Continuation of Ser. No. 943,075, Dec. 18, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 172,960
Claims priority, application Japan, Jan. 8, 1986, 61-000795
Int. Cl.[4] A63C 9/20
U.S. Cl. 280—615 6 Claims



1. A ski shoe binding structure, comprising:

a ski board having a front and a rear and having a recess formed in an upper surface thereof, said recess having a bottom;

a toe covering member an upper toe covering portion for receiving a toe of a shoe thereunder, said toe covering member being attached to said upper surface of the ski board such that a forward end of said toe covering member is positioned at a longitudinally intermediate area of said recess, said toe covering member having a lower surface with an aperture disposed therein and below said toe covering portion;

an engaging piece having a front and a rear provided in said recess and extending longitudinally therein, said engaging piece having a longitudinal axis, said engaging piece being pivotally connected towards said rear to said ski board for rotation about an axis transverse to said longitudinal axis, said engaging piece having a detent projecting upwardly therefrom, said detent being positioned beneath said toe covering member and aligned with said aperture, said detent projecting through said aperture upon upward pivotal movement of said engaging piece, said engaging piece having a manipulating portion projecting upwardly ahead of said toe covering member;

biasing means for yieldably urging said engaging piece to rotate about said transverse axis upwardly and away from said bottom of said recess;

an elongate projection extending upwardly from the upper surface of said ski board rearwardly of said recess in said ski board;

a ski shoe having a sole thereof formed with a recess complementary to said detent;

engaging means for engaging said elongate projection longitudinally with said ski shoe;

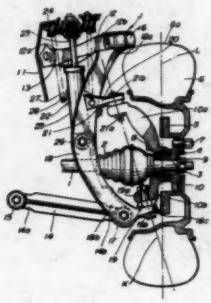
said ski shoe and said engaging piece cooperating so that when said ski shoe is stepped onto said ski board to bring said shoe into engagement with said elongate projection by way of said engaging means and slid forwardly into said toe covering member to press down said engaging piece until said recess of said ski shoe passes said detent, said detent is locked into said recess in a snap action.

4,802,688

DOUBLE LINK TYPE SUSPENSION SYSTEM

Takuya Murakami, Atsugi, and Toshihiko Kanimoto, Isehara, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 26, 1987, Ser. No. 89,447
Claims priority, application Japan, Aug. 28, 1986, 61-202256
Int. Cl.[4] B62D 7/06
U.S. Cl. 280—666 20 Claims



1. A double link type suspension system for a vehicle, comprising:

a knuckle for rotatably supporting a wheel of the vehicle, said knuckle having an upper and a lower end;

a first joint which is connected to the lower end of said knuckle;

a second joint which is connected to the upper end of said knuckle;

an upper control arm having an inboard end which is rotatably connected to a vehicle body and an outboard end;

a lower control arm having an inboard end which is rotatably connected to the vehicle body, and an outboard end which is rotatably connected through said first joint to the lower end of said knuckle;

an extension member having an upper end which is rotatably connected to the outboard end of said upper control arm, and a lower end which is rotatably connected to the outboard end of said lower control arm, said extension member being rotatably connected through said second joint to the upper end of said knuckle between the upper and lower ends of said extension member, an axis connecting said first and second joints serving as a steering axis around which the wheel is turnable to steer the vehicle.

4,802,689

SUSPENSION SYSTEM FOR RIGID VEHICLE AXLE

Friedrich Hoffmann, Schoenaich, and Franz X. Scheller, Weinstadt, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 757,939, Jul. 23, 1985, abandoned, and a continuation-in-part of Ser. No. 757,940, Jul. 23, 1985, abandoned. This application Oct. 22, 1986, Ser. No. 895,332
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1984, 3428160; Jul. 31, 1984, 3428161
Int. Cl.[4] B60G 9/00
U.S. Cl. 280—688 12 Claims

1. Axle suspension arrangement for supporting a rigid axle on a vehicle, comprising:

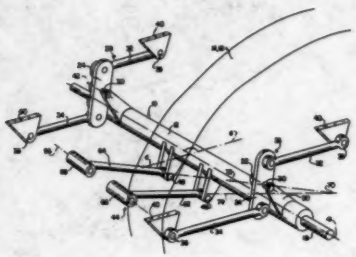
guide control means supportingly engageable with the rigid axle for guiding the movement of the rigid axle axis about a guide control pivot axis during springing movement of the rigid axle with respect to a relatively fixed vehicle body,

and additional guide arm means interposed between the rigid

axle and the vehicle body for controlling movement of the rigid axle,

said guide control means and additional guide arm means guiding movement of the rigid axle to effect positive oblique upward and rearward movements of the rigid axle axis in response to upward springing movements of the rigid axle,

wherein the guide control means includes first and second



guide control arm arrangements disposed at opposite lateral sides of the additional guide arm means,

wherein each of said first and second guide control arm arrangements includes a rocker arm pivotally attached to the rigid axle and a pair of guide arms pivotally connected to the rocker arm at opposite sides of its pivotal attachment to the rigid axle, said guide arms having their ends opposite the rocker arms pivotally attached to respective fixed vehicle body.

4,802,690

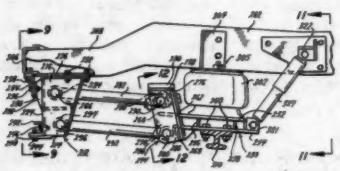
SUSPENSION ASSEMBLY FOR STEER AXLE WITH SINGLE AIR SPRING MOUNTED DIRECTLY OVER THE AXLE

John E. Raidel, Rte. 1, Box 400-M, Springfield, Mo. 65804

Continuation-in-part of Ser. No. 929,634, Nov. 12, 1986, abandoned. This application Mar. 2, 1987, Ser. No. 20,490

Int. Cl.[4] B60G *11/28*

U.S. Cl. 280—713 **14 Claims**



1. In a vehicle having a chassis with left and right longitudinally extending rail members and an axle, a compact, readily removable suspension assembly comprising:

an axle seat, a torque rod bracket, and a sway bar bracket joined together as an integral unit having an upper plate and spaced generally vertical inboard and outboard side plates with means for connecting the generally vertical side plates to the upper plate, the sway bar bracket being on the inboard side of said integral unit,

the upper plate having a forwardly extending tongue with side edges welded to the generally vertical side plates, means to connect the axle seat to the axle,

an air spring having upper and lower sides, and releasable means to connect the upper plate to the lower side of the air spring,

a spring mounting bracket connected to the chassis, and releasable means to connect the upper side of the air spring to the spring mounting bracket,

a hanger depending from the chassis,

upper and lower torque rods of equal length having first ends pivotally supported by the hanger at vertically spaced axes and second ends pivotally supported by and between the generally vertical side plates at vertically spaced axes, the space between the hanger support axes being substantially equal to the space between the torque rod bracket support axes,

a sway bar having a first end and a second end, releasable means for pivotally connecting the first end of the sway bar to the sway bar bracket, and releasable means for pivotally supporting the second end of the sway bar from the chassis at an axis spaced transversely from the sway bar bracket.

4,802,691

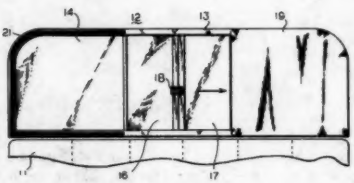
HEADREST

James C. Watkins, 103 Brown Pl., Newnan, Ga. 30263

Filed Apr. 10, 1987, Ser. No. 37,039

Int. Cl.[4] A47C *7/36*

U.S. Cl. 280—751 **4 Claims**



1. For use in a cab type vehicle having a rear, windowed cab wall, a demountable headrest assembly comprising

a substantially planar mounting board, said board being shaped to overlay a portion of the frame of the window in the cab wall,

a cushion member mounted on one surface of said mounting board, and first mounting means affixed to the other surface of said mounting board for affixing said headrest assembly to said window frame and second mounting means adapted to be affixed to the frame of the window in the cab wall,

said first and second mounting means being adapted to mate with each other to provide a firm mounting for said headrest assembly.

4,802,692

CONTINUOUS PERFORATED PAPER SHEET FOR PRINTER

Thomas N. Stryd, 7907 W. "R" Ave., Kalamazoo, Mich. 49009

Filed Aug. 20, 1987, Ser. No. 87,654

Int. Cl.[4] B42D *19/00*

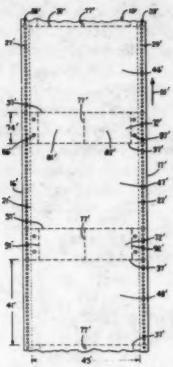
U.S. Cl. 281—5 **16 Claims**

1. An elongate paper sheet, comprising:

spaced, parallel edges located on opposite sides thereof and extending lengthwise thereof;

a plurality of pairs of transverse perforation lines each extending from one of said edges to the other thereof approximately perpendicular thereto, wherein a plurality of first sections of said paper sheet each extend between adjacent said transverse lines of respective said pairs and each have a dimension in a direction lengthwise of said sheet which is substantially greater than the dimension in said direction of each of a plurality of second sections of said sheet which each extend between the transverse lines of a respective said pair; and

a plurality of divider perforation lines which each extend between and terminate at the transverse perforation lines



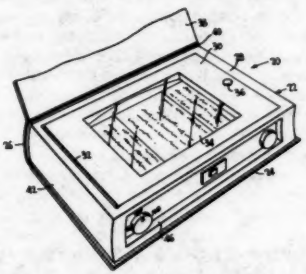
of a respective said pair, each said first section of said sheet being free of said divider perforation lines.

4,802,693

DIRECT READER BOOK

Robert A. Brown, 3205 Mt. Zion Rd., Upperco, Md. 21155

Continuation of Ser. No. 608,093, May 8, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 876,478
Int. Cl.[4] B42D *19/00*; G09B *25/00*
U.S. Cl. 281—7 15 Claims



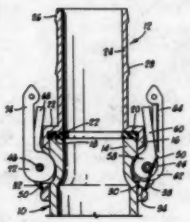
1. A direct reading book comprising a housing having a face wall, a magnifying lens carried by said face wall, means within said housing for mounting in roll form a printed web, a printed web in roll form mounted in said mounting means, said web comprising a book in miniaturized form and said mounting means providing that an intermediate portion of such printed web underlies said magnifying lens, said magnifying lens being designed to re-magnify said book, and positioning means within said housing for maintaining that portion of such printed web in constant preselected spaced relation to said magnifying lens for providing constant magnification of such printed web, said positioning means being a pair of spaced parallel shoes extending downward from the bottom surface of said face wall, and said wall, and said web mounting means includes means for advancing a web.

4,802,694

QUICK-DISCONNECT COUPLING

Edward E. Vargo, Enid, Okla., assignor to Central Machine and Tool Co., Enid, Okla.

Filed Oct. 26, 1987, Ser. No. 112,253
Int. Cl.[4] F16L *37/18*
U.S. Cl. 285—87 2 Claims



1. A quick-disconnect coupling for interconnecting a pair of tubular elements comprising:

a tubular male adapter having an end face and further having an annular groove of arcuate, concave cross-sectional configuration extending around said male adapter at a location spaced axially along said male adapter from said end face, said groove defining an arcuate concave outwardly facing surface;

a tubular female coupler including:

a tubular neck portion;

a tubular sleeve of larger diameter than said neck portion and having a pair of openings formed through the opposite sides thereof; and

a radially extending annular shoulder extending between, and interconnecting, said sleeve and said neck portion, and forming an internal seal seat within said female coupler, said sleeve receiving said tubular male adapter therewithin, with said end face facing, and extending parallel to, said internal seal seat, and with said annular groove aligned with the openings through said sleeve;

a first pivot pin secured to said tubular sleeve across one of the openings in said sleeve in a direction parallel to a diameter of said sleeve;

a first, elongated locking handle pivotally mounted on said first pivot pin and including a first locking handle cam head having a cam surface thereon and having said first pivot pin extending through said first locking handle can head, said first locking handle cam head and cam surface being so configured and positionally arranged relative to said annular groove on said male adapter that pivotation of said first locking handle to a locking position in which said first locking handle extends substantially parallel to the axis of said tubular sleeve will cause said cam head to bias said male adapter axially inwardly into said sleeve until said end face is in a sealing position relative to said internal seal seat, whereas pivotation of said first locking handle to a de-coupling release position in which said locking handle is pivoted outwardly away from said sleeve and away from said locking position will cause said cam surface to move to a position away from the concave surface of said annular groove, and will allow said male adapter to move axially outwardly with respect to said sleeve, and will allow said end face to move away from said sealing position;

a first elongated safety handle pivotally mounted on said first pivot pin and including a safety handle cam head having a radially inner surface thereon, and having said first pivot pin extending through said first safety handle cam head, said first safety handle cam head and the radially inner surface carried thereon being so configured and positionally arranged relative to said annular groove and its con-

cave, outwardly facing surface that pivotation of said first elongated safety handle to a safe position in which said first elongated safety handle extends parallel to the axis of said tubular sleeve will place a part of said radially inner surface within said annular groove of said male adapter, and prevent said male adapter from moving totally out of said sleeve, whereas pivotation of said first elongated safety handle to a release position will move said radially inner surface radially outwardly out of said annular groove and allow said male adapter to be extricated from said sleeve when said locking handle is in said de-coupling release position;

a first spring having convolutions around said first pivot pin and having a first part bearing against said first elongated safety handle and resiliently biasing said first safety handle to said safe position, and a second part bearing against said sleeve and resiliently resisting movement of said first safety handle away from said safe position, said first spring being positioned to continue to exert said resilient bias on said first safety handle to oppose movement of said first safety handle toward said release position from said safe position, with said resilient biasing of said first safety handle continuing throughout, and opposing, the entire movement of said safety handle from said safe position to said release position;

a second pivot pin secured to said tubular sleeve across the other of said openings in said sleeve and located on the opposite side of said sleeve from said one opening, said second pivot pin extending in a direction parallel to a diameter of said sleeve and parallel to said first pivot pin;

a second, elongated locking handle pivotally mounted on said second pivot pin and including a second locking handle cam head having a cam surface thereon, and having said second pivot pin extending through said second locking handle cam head, said second locking handle cam head and the cam surface carried thereon being so configured and positionally arranged relative to said annular groove, and its radially outwardly facing concave surface, that pivotation of said second locking handle to a locking position in which said second locking handle extends parallel to the axis of said tubular sleeve will cause the cam head carried on said second locking handle to bias said male adapter axially inwardly into said sleeve unit said end face is in a sealing position relative to said internal seal seat, whereas pivotation of said second locking handle to a release position in which said second locking handle is pivoted outwardly away from said sleeve and away from said locking position causes said cam surface on the cam head of said locking handle to move to a position away form the concave surface of said annular groove, and allows said male adapter to move axially outwardly with respect to said sleeve, and said e nd face to move away from said sealing position;

a second elongated safety handle pivotally mounted on said second pivot pin and including a second safety handle cam head having a radially inner surface thereon, and having said second pivot pin extending through said second safety handle cam head, said second safety handle cam head and said radially inner surface carried thereon being so configured and positionally arranged relative to the outwardly facing concave surface of said annular groove that pivotation of said second elongated safety handle to a safe position in which said second safety handle extends parallel to the axis of said tubular sleeve will place a part of said radially inner surface carried on said second safety handle within said groove, sand prevent said male adapter from moving totally out of said sleeve in an axial direction, whereas pivotation of said first safety handle to a release position will move said radially inner surface carried on the cam head of said second safety handle radially outwardly out of said annular groove and allow said male adapter to be extricated from said sleeve by movement in an axial direction at a time when said first and second locking handles are pivoted to said release positions; and

a second spring having convolutions around said second pivot pin and having a first part bearing against said second elongated safety handle and resiliently biasing said second safety handle to said safe position, and having a second part bearing against said sleeve and resiliently resisting movement of said second safety handle away from said safe position, said second spring being positioned to continue to exert said resilient bias against said second elongated safety handle to oppose movement of said second safety handle toward said release position from said safe position with said resilient biasing of said second safety handle continuing throughout, and opposing, the entire movement of said safety handle from said safe position to said release position.

4,802,695

PIPE SCREWED CONNECTION

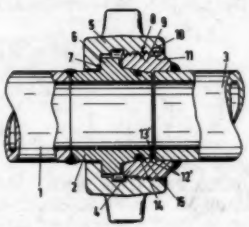
Karl Weinhold, Im Jagdfeld 43, 4040 Neuss 1, Fed. Rep. of Germany

Filed May 18, 1987, Ser. No. 50,327

Claims priority, application Fed. Rep. of Germany, May 21, 1986, 3617014; Mar. 25, 1987, 3709819

Int. Cl.[4] F16L *19/00*

U.S. Cl. 285—91 **9 Claims**



1. A liquid-tight, hydraulic, pipe screwed connection having a socket member attachable to one pipe end, a plug-in member at the opposite pipe end which can be partly inserted into the socket member, and a union nut for which the plug-in member has a bearing surface in the form of an annular shoulder and which engages over the plug-in member and is screwed on to the socket member, wherein meshing screwthreaded surfaces disposed on the union nut and on the socket member each have matchingly conical threads and cylindrical threads, said cylindrical threads intersecting said conical threads at the largest diameter of said conical threads, and said cylindrical threads being substantially fewer in number than said conical threads, whereby the angle of conicity of said conical threads is such that rotating the union nut disengages the threads of each threaded member readily by virtue of a gap which is produced between the conical threads when the threaded members are shifted longitudinally in relation to each other, and wherein opposite coaxial sealing surfaces of each of the plug-in member and the socket member are cylindrical, and a sealing ring is inserted in an annular groove in at least one of said plug-in member and said socket member sealing surfaces and wherein a split locking pin is inserted transversely through the union nut and engages a locking pin shoulder surface in said socket member.

4,802,696

QUICK CONNECT COUPLING

Satish M. Chohan, and Jerry J. Antosch, both of Rockford, Ill., assignors to The Gates Rubber Company, Denver, Colo.

Filed Oct. 23, 1986, Ser. No. 922,482

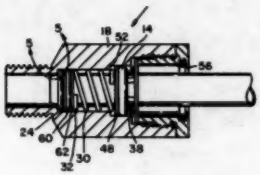
Int. Cl.[4] F16L *37/08*

U.S. Cl. 285—317 **14 Claims**

1. In a female coupling of the type with a housing having at

least two substantially coaxial bores for receiving a male end pipe portion where one of the bores is stepped to a larger diameter than the other bore; at least one O-ring disposed in the housing and with an axis oriented substantially coaxially with the bores, the O-ring defining a sealing means for the housing and a male end pipe portion; and a means for retaining part of a collared pipe end portion in the housing, the collar having a desired radial height and axial thickness; wherein the improvement comprises:

the housing having the larger diameter bore sized to receive the O-ring without radial clearance and having a generally radially extending annular shoulder between the two bores;



spring bias means disposed in the housing for biasing the O-ring against a portion of the annular shoulder, deforming the O-ring, and effecting a seal with part of the annular shoulder, the spring bias means having an end portion, juxtaposed the O-ring and an opposite end portion that is axially displaceable an amount at least equal to the desired collar thickness; and

wherein the retaining means has deflectable fingers juxtaposed the displaceable end portion of the spring bias means, the fingers deflectable an amount at least equal to the desired collar height and the fingers as a means for engaging the collar of a pipe end portion to effect retention.

4,802,697

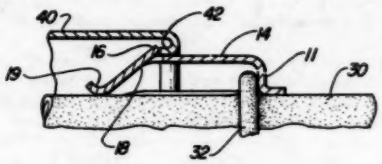
MEANS OF LOCKING TUBES INTO ENGAGEMENT WITH A PRESSURE FITTING

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Sep. 9, 1987, Ser. No. 94,688

Int. Cl.[4] F16L *39/00*

U.S. Cl. 285—319 **5 Claims**



1. A retainer for retaining a conduit with an annular bead within a receiving fitting, said retainer comprising:

a ring portion positioned peripherally about the conduit and abutting the annular bead to prohibit withdrawal of the conduit from said retainer;

at least one arm extending from said ring portion, said at least one arm extending over the conduit annual bead axially along the conduit;

means for locking said retainer to the receiving fitting, said locking means coupled with said at least one arm such that in use said at least one arm and locking means tensionally maintain the conduit in a locking relationship with the fitting; and

at least one more additional arm extending from said ring portion over the bead and axially along the conduit for maintaining concentricity of the retainer with respect to the conduit within the fitting.

4,802,698

JOINT MEANS HAVING FLANGES

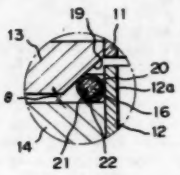
Katsuhide Fujisawa; Toshimasa Takanaka; Hiroo Bueki, and Masakatsu Takahashi, all of Kanagawa, Japan, assignors to Nippon Reinz Co., Ltd., Kanagawa, Japan

Filed Apr. 8, 1987, Ser. No. 35,937

Claims priority, application Japan, Apr. 22, 1986, 61-59617[U]; Apr. 22, 1986, 61-59618[U]; Apr. 23, 1986, 61-60182[U]

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—363 **4 Claims**



1. A joint means for fixedly connecting first and second pipes end to end and for sealing the connection of the first and second pipes, said joint means comprising:

a first flange integrally extending from the outer peripheral surface of the first pipe at an end portion thereof that includes the free end of the first pipe, a part of said first flange projecting from said free end of the first pipe, said part of said first flange having an inner peripheral surface comprising a frusto-conical surface;

a second flange integrally extending from the outer peripheral surface of the second pipe adjacent an end portion thereof that includes the free end of the second pipe,

said first flange including said frusto-conical surface and said second flange opposing each other;

nut and bolt means extending between said first and said second flanges for fixedly securing said first and said second flanges to one another to connect the first pipe to the second pipe; and

a sealing member clamped between said first and said second flanges for sealing the connection of the first pipe to the second pipe,

said sealing member having a closed loop shape and comprising heat resistant material surrounded by a thin metal sheet, the thin metal sheet having overlapped end portions one of which includes an edge of the thin metal sheet that is exposed at the periphery of the sealing member thereby defining a seam of the sealing member,

said sealing member extending around said end portion of the second pipe, and said sealing member in contact with and clamped between said frusto-conical surface of the first flange and said second flange.

4,802,699

SNAP LOCK ASSEMBLY

Gary I. Smith, Auburn, Ind., assignor to Brammall, Inc., Angola, Ind.

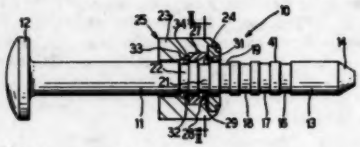
Filed Jun. 6, 1988, Ser. No. 202,312

Int. Cl.[4] B05D *33/34*

U.S. Cl. 292—327 **3 Claims**

1. A snap lock seal comprising, a bolt with a shank in which a plurality of equidistant spaced grooves are formed, a locking

member formed with a central opening through which said bolt shank can be inserted, a plurality of snap rings with substantially circular cross-sections mounted in said locking member so as to be spaced apart the same distance as the spacings of said grooves in said shanks and adapted to be received in said grooves to lock said locking member to said shank, each of said plurality of grooves formed with forward end walls which are substantially normal to the longitudinal axis of said bolt shank and each of said plurality of grooves formed with back end walls which have angles less than 90° to the longitudinal



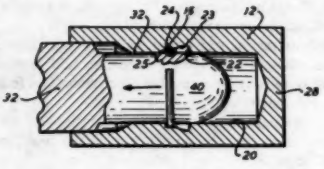
axis of said bolt shank, and said locking member formed with a plurality of snap ring sockets in which said plurality of snap rings are received and each of sockets formed with walls which are substantially normal to the longitudinal axis of said bolt shank, and each of said sockets formed with rear walls which are tapered relative to the longitudinal axis of said bolt shank such that if force is applied to remove said bolt from said locking member, the rear tapered wall of each of said sockets will press one of said plurality of snap rings downwardly into said plurality of grooves to prevent said bolt from being removed from said locking member.

4,802,700

LOCKING SEAL

David L. Stevenson; Terry R. Moore, and Terrence N. Bramall, all of Angola, Ind., assignors to Trans-Guard Industries, Inc., Angola, Ind.

Filed Nov. 9, 1987, Ser. No. 118,548
Int. Cl.[4] B65D *33/34*
U.S. Cl. 292—327 **2 Claims**



1. A locking seal comprising:

a lock body, said lock body including a bore extending partially therethrough, a first radially outwardly extending channel formed in said bore at least a portion of the surface of said channel being frusto-conical and a second radially outwardly extending channel formed in said base and in communication with said first channel, said second channel including a cylindrical surface;

a bolt for insertion within said base in said lock body, said bolt including a generally annular channel which may be selectively aligned with said first and second channels in said lock body in response to axial displacement of said rod within said lock body; and

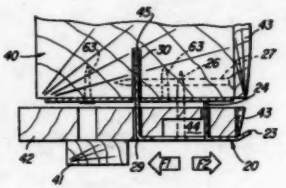
spring means received within said annular channel in said rod and one of said channels in said lock body, said spring means being split such as to be enlargeable and compressible in diameter from its no-load condition, said spring means being compressible into said annular channel in said rod in response to initial displacement of said rod in the direction out of said lock body and said spring means being compressible in response to further displacement of said rod in the direction out of said lock body such as to be received within said annular channel and said second channel in said lock body.

4,802,701

ANCHOR LATCH

George S. Mazie, 12521 Ferdline, Southgate, Mich. 48195

Filed Dec. 31, 1986, Ser. No. 948,108
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—340 **8 Claims**



1. A security latch comprising:

a wooden door frame structure having a vertical first wooden member and a vertical second wooden member, the first wooden member having spaced parallel first and second surfaces, the first wooden member being disposed in a side-by-side relationship with the second wooden member;

a latch plate having a planar outer section with a bolt-receiving opening for receiving a locking door bolt, and means for fastening said latch plate to the first wooden member in abutment with the first surface thereof, the latch plate having a planar anchor section disposed at a right angle to said outer section, the anchor section having a width greater than the thickness of the first wooden member so as to extend beyond the second surface thereof, whereby the outer section of the latch plate is disposed adjacent the first surface thereof, the anchor section having a fastener-receiving opening therein;

a planar base plate having an opening for receiving the anchor section of the latch plate, the base plate being disposed between member and the second wooden member in a spaced, parallel relationship to the outer section of the latch plate such that a portion of the fist wooden member is sandwiched between the outer section of the latch plate and the base plate, and the fastener-receiving opening in the anchor section is disposed on the opposite side of the base plate as the outer section of the latch plate; and

an elongated screw received in the second wooden member through the fastener-receiving opening in the anchor section, the screw being disposed on the opposite side of the base plate as the outer section of the latch plate.

4,802,702

MAGNETIC LIFTING TOOL

Royce D. Bownds, 411 N. Ave. E., Denver City, Tex. 79323

Filed Mar. 10, 1988, Ser. No. 166,398
Int. Cl.[4] B25J *15/06*; B66C *1/04*
U.S. Cl. 294—65.5 **5 Claims**

1. A magnetic lifting tool for use in removing ferrous debris, said tool comprising:

an "L" shaped handle including an elongate hollow vertical leg and a hollow vertical leg and a horizontal leg of lesser extent than said vertical leg, and

a hollow securement sleeve slidably secured to said handle along a first extent portion of said sleeve and fixedly secured to housing means along a second extent portion of

said sleeve, said first and second extent portions of said sleeve spaced at opposite ends of said sleeve, and

said housing means including a cylindrical housing of a first diameter and socket of a second diameter directed upwardly of said housing means accepting said securement sleeve, and

a magnetic means for magnetically attracting ferrous debris secured within said housing means, and

wherein said horizontal leg includes a frictional grip encompassing a majority of a surface defined by said horizontal leg, and

wherein said securement sleeve is formed with a series of axially spaced openings cooperative with a resilient detent secured within said vertical leg and projecting through an

opening in said vertical leg to cooperative with one of said spaced openings, and

wherein said socket is of a diameter to accept said securement sleeve therein including a plurality of fasteners to secure said securement sleeve with said socket, and

wherein said first diameter is six inches and said housing means of a height of one inch to define a six to one ratio of said first diameter to said height, and

wherein said housing means includes a working surface formed of a magnetically attractive metal,

and said surface formed along and defining a lowermost face of said housing, and

an upper surface and sides of said housing means formed of plastic-like material.

4,802,703

TWEEZERS WITH AUTOMATIC OPENING AND CLOSING

Jean P. Gabel, La Wantzenau, France, assignor to Manufacture des Outils Dunoot S.A., Montignez, Switzerland

Continuation of Ser. No. 829,380, Feb. 13, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 110,631

Claims priority, application Switzerland, Feb. 20, 1985, 771/85

Int. Cl.[4] B65G 7/12

U.S. Cl. 294—99.2 **14 Claims**

1. Tweezers, with automatic locking, comprising:

(a) two legs each having forward and back ends with tips at the forward ends and a middle portion spaced from the back end, the legs being joined together at the back ends and having a normal position biased away from each other in the middle portions and at the forward ends and tips with no intervening structure therebetween, the legs in the middle portion being adapted to be subjected to a closing pressure to move the legs in the middle portion toward each other so as to move the forward ends and tips to a closed position, said legs further having opposite outside faces extending therealong from the back ends to the forward ends;

(b) a rigid closing ring having opposite internal faces spaced from each other by a predetermined distance and freely and slidably mounted on said legs for sliding movement without friction and under the influence of gravity between said back ends and the middle portion thereof, with said opposite internal faces opposing and moving along the opposite outside faces of the legs; and

(c) the spacing of the outside faces in said middle portion of the legs when in said normal position being greater than the predetermined spacing of the internal faces of said ring to frictionally retard movement of said ring therealong and said spacing of the outside faces being less than said predetermined spacing with the outside surfaces of the

legs spaced from the opposed inside surfaces of the ring when said closing pressure is applied to permit the ring to slide under the influence of gravity toward the tips and over at least part of the middle portion of said legs and thereby hold said tips closed upon release of said closing pressure by frictional retainment of said ring on the middle portion of said legs and to further permit free sliding movement away from the forward ends under the influence of gravity upon exerting a sufficient closing pressure to space the outside faces of the legs directly underlying the ring at a distance from each other which is less than said predetermined spacing with the outside surfaces of the legs spaced from the opposed inside surfaces of the ring; and

(d) stop means at the back ends of the legs to stop movement of the ring in a direction toward the back ends.

4,802,704

SPARE RIB HOLDER

Thomas P. Burns, 70 Oakridge La., Albertson, N.Y. 11507

Filed Mar. 11, 1988, Ser. No. 167,049

Int. Cl.[4] A47G 21/10; A47J 43/28

U.S. Cl. 294—99.2 **1 Claim**

1. A spare rib holder comprising two oppositely disposed members pivotally joined at one end to simulate retractable jaws, the lower member extending forwardly of the upper member, said members being spring biased with respect to each other so as to normally be in open position, the upper

member being provided with a row of teeth at its free end, said teeth extending transversely of the holder; the lower member having a forwardly projecting uninterrupted scoop for accessing a spare rib, the scoop being provided with a retaining wall at its sides, a spare rib being clampable between the teeth and the scoop after being accessed by the scoop, the outer surfaces of both members being provided with finger grips so the device may be conveniently held between the thumb and index finger and squeezed closed thereby.

4,802,705

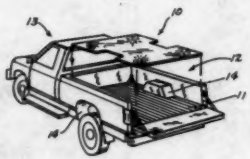
TRUCK BED LINER AND METHOD OF FORMING SAME

Dennis L. Elwell, Johnston, Iowa, assignor to Dee Zee, Inc., Des Moines, Iowa

Filed Jan. 4, 1988, Ser. No. 140,610

Int. Cl.[4] B62D *33/02*

U.S. Cl. 296—39.2 **10 Claims**



1. A liner for protecting the corrugated or flat exposed floor of a truck bed comprising a flat mat of an aluminum alloy conforming generally to the outline of the truck bed, said mat originally formed in a coil, said coil comprising a strip having a length considerably longer than said mat, said coil having been flattened and formed into a plurality of mats of identical shape, each of said mats again formed into a roll for shipping purposes.

4,802,706

ROTARY SEAT FOR VEHICLE

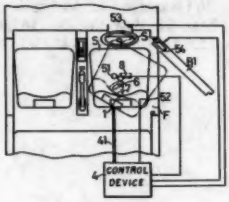
Sadahisa Onimaru, Nishio; Toshiaki Shimogawa, Okazaki; Masahiro Taguchi, Hazu, and Satosi Kuwakado, Nukata, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 4, 1986, Ser. No. 870,354

Claims priority, application Japan, Jun. 4, 1985, 60-121199; Jul. 11, 1985, 60-153004

Int. Cl.[4] B60N *1/02*

U.S. Cl. 296—68 **5 Claims**



1. A rotary seat for a vehicle, comprising:

a support shaft mounted upright on a floor of the vehicle;

a seat cushion member rotatably supported on said support shaft;

driving means connected to said seat cushion member for automatically rotating said seat cushion member between a direction toward a front of said vehicle and a direction toward a side door of said vehicle;

means for disconnecting said driving means from said seat cushion member to allow said seat cushion member to be manually rotatable, said disconnecting means comprising a rodlike member provided on one of said vehicle floor and said seat cushion member eccentrically with a center of rotation of said seat cushion member, and a pair of engaging surfaces provided on the other one of said seat cushion member and said vehicle floor, said rod-like member having a locus of movement with respect to one of said vehicle floor and said seat cushion member, said engaging surfaces being movable along the locus of movement of said rod-like member, independently of movement of said seat cushion member, said engaging surfaces being separated by a distance substantially equal to a total range of movement of said rod-like member; and

control means for controlling said riving means and said disconnecting means to place said seat cushion member in an automatic rotating mode or a manual rotating mode, and said control means including means for controlling said disconnecting means to place said seat cushion member in said automatic rotating mode by pushing said rod-like member with one of said engaging surfaces, and for placing said seat cushion member in said manual rotating mode by positioning said engaging surfaces at extreme ends of said locus of movement of said rod-like member.

4,802,707

SLIDING ROOF FOR AUTOMOBILES

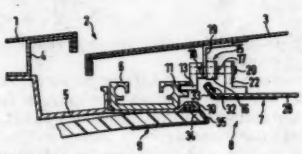
Albert Schlapp, Dreieich, Fed. Rep. of Germany, assignor to Rockwell-Golde GmbH, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,274

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707697

Int. Cl.[4] B60J *7/053, 7/195*

U.S. Cl. 296—214 **2 Claims**



1. In a sliding roof for an automobile having a roof, a roof opening, lateral guide rails adjacent said roof opening, a rigid sliding lid which is slidably guided by said guide rails, and a reinforcing frame connected to said roof for framing the roof opening at the front and sides of said roof opening, that improvement comprising:

a sliding roof frame below said reinforcing frame;

said guide rails being supported on said sliding roof frame;

said guide rails having guide channels open towards said roof opening and located at an inner periphery of said sliding roof frame;

a fixed liner below said sliding roof frame terminating in a vertical cross section having an acute angle formed between a bottom side and an inner linear edge of said fixed liner;

a connecting strip over an edge of said sliding roof frame and overlying said fixed liner adjacent a flat upper edge of said liner which strip surrounds the edges of said sliding roof frame, said connecting strip extending above said flat upper edge of said fixed liner;

a substantially rectangular movable lid liner having a peripheral edge which extends around the four sides of said movable lid liner, which edge is upwardly bent at an angle which is complementary to the acute angle of each edge of said fixed liner whereby the peripheral edge of said movable lid liner provides a counter surface for said inner edge of said fixed liner thereby providing substantially parallel surfaces which are adapted to mate in an inclined

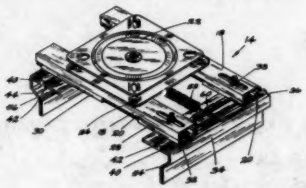
direction, said respective mating surfaces sealing against each other in a closed position to prevent any separation of the respective mating edges which would allow traveling noises to enter the interior of said vehicle.

4,802,708

REMOVABLE BOAT SEAT

Wilbur Vos, and Donavon E. Musgrove, both of P.O. Box 84, Sully, Iowa 50251

Filed Apr. 15, 1987, Ser. No. 40,212
Int. Cl.[4] B63B *29/04*
U.S. Cl. 297—252 1 Claim



1. A seat for removable attachment to a boat thwart or any like structure having opposing edges, comprising:

a. a main frame continuously longitudinally extensible between an extended position and a retracted position;

b. a pair of grasping members, mounted to either end of said main frame and including a plurality of spaced parallel lengthwise slots, for engaging the thwart edges;

c. said main frame including a pair of substantially parallel channel members having upper and lower surfaces with slide portions formed on their lower surfaces; a pair of substantially parallel first slide members mounted in an adjustably spaced apart relation to one of said grasping members, and a pair of substantially parallel matching second slide members mounted in an adjustably spaced apart relation to the other of said grasping members, each of said first and second slide members being slidably mounted to the slide portions of the channel members.

d. said first and second and slide members include releasable attachment means slidably received within said slots for adjustably mounting said first and second and slide members to said grasping members;

e. means extending between the grasping members for biasing said grasping members toward a retracted position to secure said main frame to the thwart;

f. a turntable mounted on the upper surface of said channel members of said main frame; and

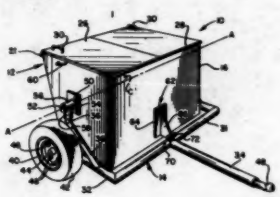
g. a seat member mounted on said turntable for rotation about a generally vertical axis.

4,802,709

DUMPING UTILITY TRAILER

Mark G. Jones, Paris, Tex., assignor to J-10, Inc., Paris, Tex.

Continuation of Ser. No. 524,651, Aug. 19, 1983, abandoned.
This application Nov. 25, 1985, Ser. No. 801,508
Int. Cl.[4] B60P *1/24*
U.S. Cl. 298—10 1 Claim



1. A dumpable utility trailer comprising a frame assembly, a container assembly rotatably connected to said frame assembly, and a releasable latch assembly;

said frame assembly comprising a transverse member having spaced apart longitudinal members extending rearwardly therefrom, a singular towing member extending forwardly of said transverse member and connected thereto and having disposed at the forwardly extending end thereof a trailer hitch adapted to releasably couple said dumpable utility trailer to a tow vehicle, at least one wheel connected to each of said longitudinal members, and upwardly extending support arms adapted to connect said container assembly to said longitudinal members, said frame assembly being devoid of structure extending transversely across its width beneath or rearwardly of said container assembly;

said container assembly comprising container means, and means for rotatably connecting said container means to said upwardly extending support arms so as to permit rotational motion of said container means between the spaced apart longitudinal members of said frame assembly from an upright position to a fully inverted dumping position, and thereafter, by reversing the direction of rotation, back to an upright position;

said means for rotatably connecting said container means to said upwardly extending support arms defining a rotational axis of said container means that extends generally parallel to said transverse member at substantially the same level as and forward of the center of gravity of the container means when said container means is in an upright position relative to said frame assembly;

said transverse member of said frame assembly being disposed forward of said container means when said container means is in an upright position relative to said frame assembly; and

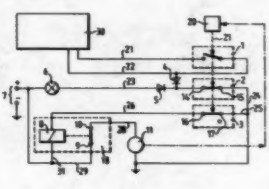
said latch assembly being adapted to maintain said container means in an upright position relative to said frame assembly until said latch assembly is released to effect dumping.

4,802,710

ELECTRIC SWITCHING DEVICE

Jochen Burgdorf, Offenbach-Rumpenheim, and Franz Latka, Niddatal, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 20, 1987, Ser. No. 112,190
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636263
Int. Cl.[4] B60T *11/18, 17/22*
U.S. Cl. 303—11 2 Claims



1. An electric switching device for monitoring the operation of a hydraulic brake system for an automotive vehicle equipped with a brake slip control device, said electric switching device comprising first switch means adapted to switch the brake slip control device on and off, second switch means for operating a warning lamp, third switch means for controlling a hydraulic pressure pump, a brake system pressure responsive actuating element connected to said first, second, and third switch means, said first switch means including means to make contact through said switch, said second switch means including means to break contact through said switch, and circuit means providing for functional redundancy of said first switch

means including means electrically connecting said first switch means to said second switch means to maintain said brake slip control device in a switched off position in the event said first switch remains in a switched on position and pressure in said hydraulic brake system remains below a threshold value.

4,802,711

ANTI-LOCK CONTROL METHOD FOR VEHICLE

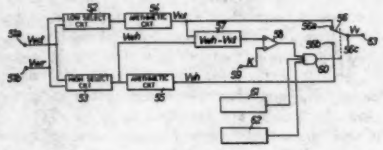
Tetsuji Muto; Shohei Matsuda; Yoshihiro Iwagawa, and Toshio Yahagi, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,674

Claims priority, application Japan, Jan. 26, 1987, 62-15474

Int. Cl.[4] B60T *8/66, 8/70*

U.S. Cl. 303—96 **5 Claims**



1. An anti-lock control method for a vehicle comprising the steps of integrating wheel speeds to estimate a vehicle speed, comparing said wheel speeds with a reference value derived from said estimated vehicle speed to judge whether wheels are entering a locked state, and reducing a brake pressure to wheel brakes when said wheels are entering a locked state, wherein when a difference between a signal value derived from a lower one of the wheel speeds and a signal value derived from a higher one of the wheel speeds is larger than a predetermined value, a range of condition for judging that said wheels are about to be locked is enlarged.

4,802,712

ANTILOCK SYSTEM FOR A VEHICLE HAVING POWER-ASSISTED HYDRAULIC MULTIPLE-CIRCUIT BRAKE SYSTEM

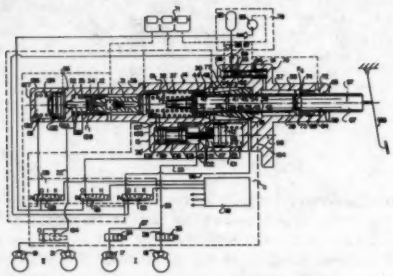
Reinhard Resch, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 686,477, Dec. 26, 1984, Pat. No. 4,629,258. This application Apr. 2, 1986, Ser. No. 847,225

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 3511974

Int. Cl.[4] B60T *8/44*

U.S. Cl. 303—114 **18 Claims**



1. An antilock system for a vehicle having a power assisted hydraulic brake system comprising:

a control cylinder means having a primary piston separating a primary output pressure space from a boosting space, and means for applying pedal force to said piston;

a pressure modulator means having a floating piston separating a modulator input space, which is connected to said primary output pressure space, from a modulator output space which is connected to a first brake circuit, and a counter piston delimiting a counter pressure space on one side and engaging said floating piston;

an auxiliary pressure source;

a proportional control means for providing an auxiliary proportional pressure which is proportion to said pedal force; and

a control valve means connected to said boosting space, said counter pressure space, said auxiliary pressure source, and said proportional control means for connecting said auxiliary proportional pressure to said boosting space in a normal braking position and connecting said auxiliary pressure source to said counterspace in an antilocking position.

4,802,713

SYSTEM FOR CONTROLLING MOTOR VEHICLE BRAKES

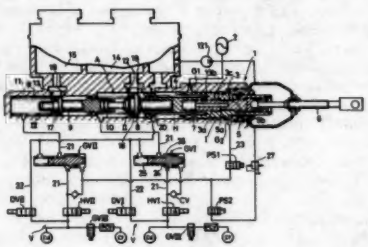
Kinji Ogino, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Saitama, both of, Japan

Filed Sep. 9, 1987, Ser. No. 94,554

Claims priority, application Japan, Sep. 10, 1986, 61-211440

Int. Cl.[4] B60T *8/42, 13/68*

U.S. Cl. 303—119 **5 Claims**



1. A system for controlling motor vehicle brakes comprising:

means for detecting status of each of driving and driven wheels of a motor vehicle;

means for supplying hydraulic pressure to and exhausting hydraulic pressure from brakes of each of said driving and driven wheels; and

means for controlling the supply-and-exhaust means according to an output of the detection means,

said supply-and-exhaust means comprising:

an accumulator;

means for decompressing hydraulic pressure supplied from said accumulator; and

means for switching a passage way from said accumulator to said decompression means.

4,802,714

DESK WITH AN ADDITIONAL LECTERN

Helmut Steinhilber, Vorrutiweg 12, CH-6052 Hergiswil, Switzerland

Filed Dec. 7, 1987, Ser. No. 129,735

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642672; European Pat. Off., Aug. 29, 1987, 87112619.9

Int. Cl.[4] A47B *17/00*

U.S. Cl. 312—196 **30 Claims**

1. A desk

a lectern and,

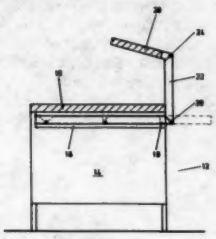
means for slidably guiding said lectern into a resting position

under the top of said desk, and for enabling said lectern to be pulled from said resting position into a working position in which said lectern projects over said desktop, comprising:

(a) at least one extension;

(b) means secured to said desk beneath said desktop for slidably receiving said extension;

(c) at least one supporting arm;



(d) means for pivotally connecting said supporting arms to said extension; and

(e) means for pivotally connecting said lectern to said supporting arm;

(f) said first mentioned means and said lectern being free of means for supporting said lectern by engaging said desktop; whereby said lectern is supported in said working position by said supporting arm, said extension and said receiving means.

4,802,715

DEVICE FOR THE STORAGE OF OBJECTS IN A PLURALITY OF CONTAINERS

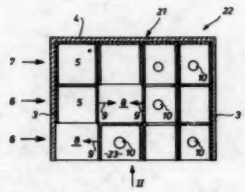
Walter Gröbly, Höchweg, CH-8914, Aeugst a.A., and Bruno Stocker, Neugasse 3, CH-9442 Berneck, both of Switzerland

Continuation of Ser. No. 852,847, filed as PCT EP85/00365 on Jul. 23, 1985, published as WO86/00791 on Feb. 13, 1986. This application Dec. 23, 1987, Ser. No. 136,479

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1984, 3428198

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—299 **12 Claims**



1. A device for the storage of objects in a box which is designed as a cabinet, drawer or the like, in which respect the objects are stored in a plurality of containers which fill up the basal surface of the box and in which said containers are open on at least one side, and the containers are slidably mounted in several planes one above the other and, as required, also one behind the other in the box, in which respect arranged in each plane between the containers is an access opening through which the containers of the plane lying therebelow or therebehind can be reached, characterised in that, in the design of the box (21) as a cabinet, several planes (6,7) lying one behind the other are formed by containers (40) which lie vertically in respectively one plane one above the other, in that in each plane (6,7) a gap (8) is formed between the containers (40) and in that the containers (40) in each plane (6,7) are guided vertically slidably in the box (21).

4,802,716

FITTING ASSEMBLY FOR CONNECTING THE SIDEWALL OF A DRAWER TO THE REAR WALL THEREOF

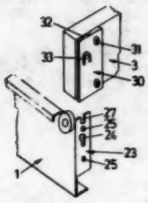
Erich Röck, Höchst; Helmut Hollenstein, Lustenau, and Josef Brunner, Höchst, all of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed May 5, 1987, Ser. No. 46,175

Claims priority, application Austria, May 14, 1986, 1280/86

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—330 R **13 Claims**



1. A fitting assembly for connecting the rear end of a side wall of a drawer to the respective end of a rear wall of the drawer, said assembly comprising:

a fastening plate to extend inwardly from the rear end of the drawer side wall at a right angle thereto, said fastening plate having in an upper edge thereof an open-ended slot, said fastening plate having therethrough a keyhole-shaped opening, and said fastening plate including fastening means for use in connecting said fastening plate to a rear side of the drawer rear wall; and

holding means, to be connected to the rear side of the drawer rear wall, for cooperation with at least said open-ended slot of said fastening plate for clamping said fastening plate to the rear side of the drawer rear wall, said holding means comprising a plate to be connected to the rear side of the drawer rear wall at a position spaced rearwardly therefrom to define a gap therebetween, such that said fastening plate may be inserted relatively upwardly into the gap, said plate having extending forwardly therefrom a tap to fit within said open-ended slot in said fastening plate.

4,802,717

INFRARED AFOCAL ZOOM TELESCOPE

Reynold S. Kebo, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 21, 1986, Ser. No. 854,373

Int. Cl.[4] G02B *13/14, 15/16*

U.S. Cl. 350—1.3 **19 Claims**

1. An infrared afocal zoom telescope comprising:

a first fixed positive lens group;

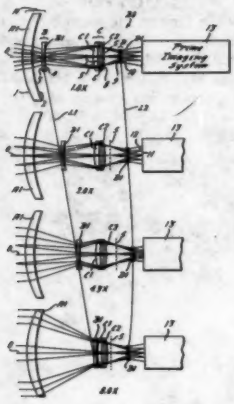
a second fixed positive lens group spaced from the first lens group, said second fixed lens group comprising a doublet having a germanium positive meniscus lens and a zinc selenide meniscus lens;

a front negative zoom lens disposed between the first and second fixed lens groups;

a rear negative zoom lens disposed on an opposite side of the second fixed lens group; and

means for mechanically compensating the telescope by moving the zoom lenses relative to each other between a first position defining a magnification power of at least 6X wherein the front zoom lens is disposed adjacent the positive meniscus lens of the second fixed lens group to form a weak negative lens group, with said means moving the zoom lenses to a second position defining a magnification power at least of unity or less wherein the front zoom

lens is spaced from the positive meniscus lens of the second fixed lens group; and



whereby the lenses are selected and arranged to prevent the formation of an image between the first lens group and said rear negative zoom lens.

4,802,718

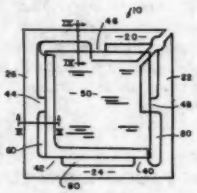
ONE PIECE FRAME FOR HOLDING A HOLOGRAPHIC ELEMENT IN A HOLOGRAPHIC SYSTEM

Kenneth G. Leib, Wantagh, and Suey L. Jue, deceased, late of Hicksville, both of N.Y. (by Catherine Jue, executrix), assignors to Grumman Aerospace Corporation, N.Y.

Filed Sep. 3, 1986, Ser. No. 903,275

Int. Cl.[4] G03H *1/04*; A47G *1/06*; G03B *17/26*

U.S. Cl. 350—3.6 **18 Claims**



1. A one piece frame for holding a holographic element in a holographic system, comprising:

a border portion forming an outside border of the frame, and being flexible between an open position for receiving the holographic element, and a closed position for holding the holographic element in the frame;

a seating portion connected to and extending inward from the border portion to seat against a back surface of the holographic element; and

a plurality of lateral positioning tabs connected to and extending inward from the border portion, above the seating portion, the lateral positioning tabs being spaced apart from each other and along the border portion to apply upward, downward, leftward and rightward forces to the holographic element to force said element into, and to hold the holographic element in, a centered position in the frame and spaced from said border portion thereof;

the border portion being biased toward the closed position to hold the holographic element against the lateral positioning tabs in a fixed position in, and with a great angular orientation relative to, the frame, and to cooperate with the holographic element to maintain the frame in a fixed preset shape to facilitate placing and holding the holographic element in a precise location and orientation in the holographic system.

4,802,719

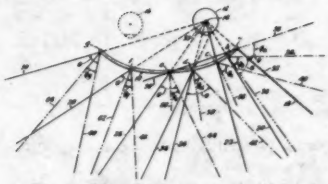
INFRA-RED LASER SHIELD

Jose Magarinos, and Daniel Coleman, both of Thornwood, N.Y., assignors to Farrand Optical Co., Valhalla, N.Y.

Continuation-in-part of Ser. No. 525,116, Aug. 22, 1983, abandoned, and a continuation-in-part of Ser. No. 639,661, Aug. 13, 1984. This application Jul. 24, 1985, Ser. No. 758,515

Int. Cl.[4] G03H *1/04*; G02B *5/32*; G02C *7/10*

U.S. Cl. 350—3.65 **44 Claims**



3. A method of making a holographic optical element, comprising the steps of:

(a) recording an interference pattern in a sensitive film disposed on a substrate having a first shape;

(b) developing said interference pattern;

(c) removing the sensitive film from the substrate with the interference pattern recorded in it; and

(d) adhering the removed sensitive layer to a substrate having a second shape.

4,802,720

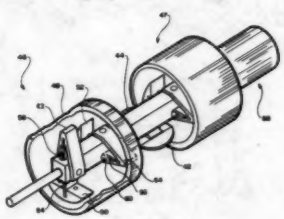
FLEXURAL PIVOT

Dean R. Paulsen, 918 Belmont St., Watertown, Mass. 02172

Filed Jun. 30, 1987, Ser. No. 68,637

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.6 **4 Claims**



1. A scanner comprising:

A. a base;

B. a first elongated flexure member having first and second ends and a longitudinal axis, being secured to the base at its first end, and being adapted for flexure along its longitudinal axis to translate its second end;

C. an armature having a pivotal axis and adapted to pivot about its pivot axis;

D. a first clamp member for securing the second end of the first flexure member to the armature so that the armature pivots about its pivot axis when the first flexure member flexes along its longitudinal axis, the first clamp member forming a joint region and a pair of arm regions extending from the joint region, the joint region forming a recess receiving the second end of the first flexure member and being deformable by flexure of the arm regions toward

each other to clamp the second end of the first flexure member; and

E. first fastening means, spaced from the second end of the first flexure member, for securing the arm regions of the first clamp member to the armature to support the armature at a position spaced from the second end of the first flexure member and to deflect the arm regions of the first clamp member toward each other to clamp the second end of the first flexure member in the recess, whereby the first fastening means acts to secure the second end of the first flexure member to the first clamp member without being positioned at the second end of the first flexure member.

4,802,721

SCANNING OPTICAL SYSTEM

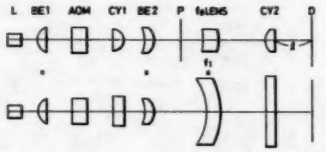
Hisao Fujita, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 784,366, Oct. 4, 1985, abandoned. This application Sep. 14, 1987, Ser. No. 97,297

Claims priority, application Japan, Oct. 5, 1984, 59-208345

Int. Cl.[4] G02B *26/10, 13/18*

U.S. Cl. 350—6.8 **5 Claims**



1. A scanning optical system comprising a laser as a light source, a deflector for deflecting and scanning the emitted light of said laser, and a focusing element for converging the emitted light of said deflector on the scanning surface, characterized in that at least one optical element having an aspherical, non-planar, contour in section in a scanning direction is arranged at the rear of said focusing element.

4,802,722

LIGHTPEN

Sven A. R. Persson, Higersten, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE86/00078, § 371 Date Oct. 22, 1986, § 102(e) Date Oct. 22, 1986, PCT Pub. No. WO86/05280, PCT Pub. Date Sep. 12, 1986

PCT Filed Feb. 24, 1986, Ser. No. 934,393

Int. Cl.[4] G02B *1/04, 6/00*

U.S. Cl. 350—96.10 **15 Claims**

1. An optical cable adapted for use in reading an optical information carrier, said cable comprising a light conductor adapted for transmitting light from the information carrier to a light-sensitive receiver, the light conductor including a major portion consisting of an optical fibre made of an easily bendable material and having an end face, and an end portion secured to and projecting from said end face of said major portion in a direction facing away from the light-sensitive receiver and consisting of a separate optical fibre, the light reception angle (α) of which, for obtaining good resolution, is less than the corresponding angle of the said major portion.

4,802,723

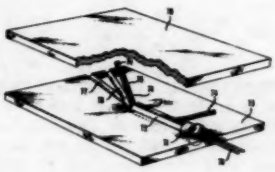
OPTICAL FIBER TAP

Calvin M. Miller, Lilburn, Ga., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murry Hill, N.J.

Filed Sep. 9, 1982, Ser. No. 416,363

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.15 **14 Claims**



1. A device for tapping energy from an optical fiber CHARACTERIZED in that said device comprises a tube of transparent material adapted to substantially surround a continuous portion of an optical fiber and having a bend therein adapted to form a bend in said fiber, and with a first detector being optically coupled to a first end of said tube so as to detect optical energy propagating axially along a first direction of said tube.

4,802,724

RESERVE DEVICE FOR OPTICAL FIBERS

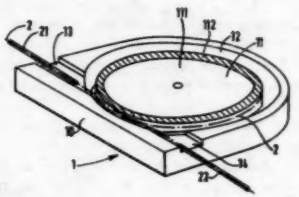
Claude R. Fraize, Boudoufle; Christian Forja, Wissous, and Robert Calevo, L'Hay les Roses, all of France, assignors to Societe Anonyme de Telecommunications and Societe Industrielle de Liaisons Electriques, Paris, France

Filed Jul. 15, 1987, Ser. No. 74,304

Claims priority, application France, Jul. 15, 1986, 86 10270

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **6 Claims**



1. Apparatus for protectively containing a reserve length of at least one optical fiber disposed within two protective tubular ducts, comprising:

a base element having a flat bottom and an internal substantially annular recess formed around a circular central core having a predetermined diameter, the annular recess having transverse extensions aligned past the central core so that an overall recessed form like an omega "Ω" is defined thereby, the transverse extensions respectively providing inlet and outlet channels for said at least one optical fiber passing into the recess to go around the core and out from said base element; and

a lid firmly attachable to said base to cover the overall omega-shaped recessed form while squeezing said ducts one each within said transverse extensions thereof to immobilize the same with respect to the base and the lid, whereby said at least one optical fiber entering one of said transverse extensions through said immobilized corresponding tubular duct can be disposed bare in a predetermined length around said core and leaves the other of said

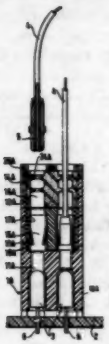
transverse extensions through the other of said corresponding protective ducts immobilized thereat.

4,802,725

OPTO-ELECTRONIC CONNECTION DEVICE

André Borne, and Marcel Jusseau, both of Villeurbanne, France, assignors to Cgee Alsthom, Levallois-Perret, France

Filed Aug. 25, 1982, Ser. No. 411,723
Claims priority, application France, Aug. 28, 1981, 81 16427
Int. Cl.[4] G02B 6/36, 7/26
U.S. Cl. 350—96.20 5 Claims



1. A transmission head for connecting at least one opto-electronic component mounted on a printed circuit board to an optical fiber fitted with a connecting terminal having a radially enlarged flange intermediate of its ends, said transmission head comprising:

at least one junction block of generally parallelepipedal shape and forming top and bottom surfaces,

at least one channel extending the full height of said junction block from said top surface to said bottom surface and opening onto said bottom surface and being sized at its bottom end to receive and house an opto-electronic component mounted on said printed circuit board,

a single groove within said junction block from said top surface downwardly to peripherally enlarge a portion of the channel above said opti-electronic component,

a hollow support member and a hollow sealing member in end abutment positioned in inverse order within said groove so as to form internally a channel axially aligned with the channel of said junction block, and

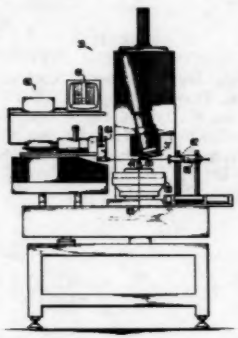
a metal sleeve fixedly mounted internally of said hollow support member and having internally directed resilient longitudinal tongues such that an optical fiber projecting downwardly through said hollow sealing member and said hollow support member, in that order, has said radially enlarged flange positioned below said internally directed resilient longitudinal tongue to lock said optical fiber connecting terminal to said junction block under the ends of said resilient longitudinal tongue and to thereby effect an optical connection between the end of said connecting terminal and said opto-electronic component within said channel in end abutting fashion.

4,802,726

METHODS OF AND APPARATUS FOR RECONFIGURING OPTICAL FIBER CONNECTOR COMPONENTS AND PRODUCTS PRODUCED THEREBY

John M. Palmquist, Lilburn, and Morton J. Saunders, Atlanta, both of Ga., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Oct. 8, 1987, Ser. No. 106,095
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 24 Claims



1. A method of configuring an end portion of a plug which is adapted to terminate an end portion of an optical fiber, said method including the steps of:

inserting an elongated gauging member having a longitudinal axis into a passageway which extends through an end portion of the plug such that a portion of the gauging member extends beyond an end face of the end portion of the plug;

holding the plug so that it may be turned about an axis of rotation;

turning rotatably the plug about the axis of rotation;

determining the location of the axis of rotation about which the plug is turned;

directing a beam of light into engagement with the portion of the gauging member that extends beyond the end face of the plug in a direction transverse to the longitudinal axis of the gauging member;

determining the location of the centroid of the gauging member adjacent to the end face of the plug at a first position of the plug and then at a second position after the plug has been turned rotatably through a predetermined angle;

determining the eccentricity of the gauging member from the axis of rotation;

moving the plug to cause the centroid of the gauging member adjacent to the end face of the plug to coincide with the axis of rotation; and

configuring the plug to cause the centroid of the gauging member adjacent to the end face of the plug to coincide

with the axis of rotation and the axis of revolution of the configured outer surface of the end portion of the plug.

23. A plug which is adapted to terminate an end portion of an optical fiber, said plug being configured in accordance with the method of claim 1.

4,802,727
POSITIONING OPTICAL COMPONENTS AND WAVEGUIDES

Ian W. Stanley, Ipswich, England, assignor to British Telecommunications public limited company, United Kingdom

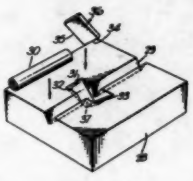
PCT No. PCT/GB86/00626, § 371 Date Jun. 11, 1987, § 102(e) Date Jun. 11, 1987, PCT Pub. No. WO87/02474, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 16, 1986, Ser. No. 80,467

Claims priority, application United Kingdom, Oct. 16, 1985, 8525458; Oct. 16, 1985, 8525459; Oct. 16, 1985, 8525460; Oct. 16, 1985, 8525461; Oct. 16, 1985, 8525462; Oct. 23, 1985, 8526189

Int. Cl.[4] G02B 6/42

U.S. Cl. 350—96.20 12 Claims



6. An optical assembly comprising an optical component having at least two supporting surfaces and at least one optical waveguide which have been positioned in alignment with one another by the method of:

(a) forming at least one elongate waveguide and a locating groove in a common single crystal substrate, the step of forming the locating groove including anisotropically etching the substrate to form a self-limited V-shaped groove, the included angle of the locating groove being substantially equal to the angle between the supporting surfaces of the optical component; and

(b) mounting the optical component in the locating groove; the relative positions of the locating groove and the or each waveguide being such that in use an optical beam may be coupled between the optical component and the or each waveguide.

4,802,728
PIN PLUG WITH AN OPTICAL FIBER

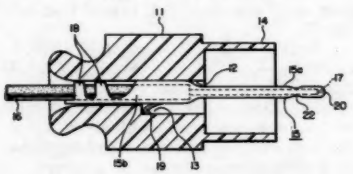
Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Feb. 8, 1988, Ser. No. 153,381

Claims priority, application Japan, Feb. 12, 1987, 62-19482

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.20 3 Claims



1. A pin plug with an optical fiber, comprising:

a columnar plug body of a molded insulating material;

a first through hole extending through said plug body along an axis thereof;

a recess in an inner surface of said first through hole;

a cylindrical portion integral with said plug body on the front side thereof in axial alignment with said first through hole;

a ferrule having a large-diametered portion fixedly held in said first through hole, said ferrule having a projecting portion whose inner and outer diameters are smaller than those of said large-diametered portion, said projecting portion extending integrally from said large-diametered portion, axially and forwardly thereof, and projecting out of a front end of said cylindrical portion;

a ring-shaped groove in the outer peripheral surface of said projecting portion adjacent the front end thereof;

a second hole in the front end of said projecting portion;

an optical fiber cable inserted through said plug body and fitted into said ferrule, an end portion of said optical fiber cable having its outer sheath removed and inserted into said projecting portion of said ferrule, a tip end portion of said optical fiber cable having its optical fiber exposed and fitted into said second through hole so that the extreme end of said exposed optical fiber is flush with the front end face of said projecting portion of said ferrule;

a pawl extending rearwardly and outwardly integrally from said large-diametered portion of said ferrule in engagement with said recess in the inner surface of said first through hole; and

a cable clamping portion at the rear end of said large-diametered portion of said ferrule for clamping said optical fiber cable;

said ferrule, said pawl and said cable clamping portion being integral portions of a cut and bent sheet metal.

4,802,729
DEVICE FOR FOCUSING A LIGHT BEAM AND MACHINE FOR WELDING OPTICAL FIBRES USING THIS DEVICE

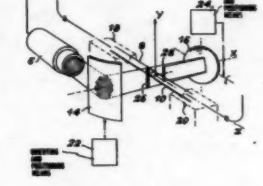
Loïc Rivoallan, Tossen hat Kermonoch, 22140 Begard, and Jean-Yvon Guilloux, 12 Chemin de Convenant Ar Groas, 22560 Trebeurden, both of France

Filed Jan. 7, 1987, Ser. No. 1,193

Claims priority, application France, Jan. 9, 1986, 86 00219

Int. Cl.[4] G02B 6/38

U.S. Cl. 350—96.21 4 Claims



1. A machine for welding an end of an optical fiber to an end of another optical fiber, said machine comprising: means for positioning and holding said ends against one another along a first axis, a light source capable of generating a light beam of circular cross section and capable of heating the ends of the fibers, and a device for focusing the light beam in the vicinity of said ends, the focusing device comprising: a first optical means for focusing the light beam of circular cross section into an elongated focal spot to one side of said optical fibers, paral-

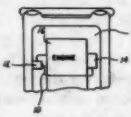
lel to a second axis perpendicular to said first axis, and a second optical means facing the first optical means and forming an elongated image spot substantially parallel to the elongated focal spot on a side opposite said one side of said fibers, whereby said ends of said fibers are exposed to and heated by the beam between the spots.

4,802,730

OPTICAL FIBER CABLES FOR MOTOR VEHICLE ENGINE COMPARTMENT APPLICATIONS

Philip A. Chatfield, West Haven, and Eugene Shapiro, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 10, 1986, Ser. No. 929,094
Int. Cl.[4] G02B 5/14
U.S. Cl. 350—96.23 13 Claims



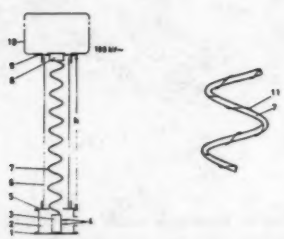
1. A compartment containing:
a source of heat comprising an engine;
first and second electrical or electronic devices; and
an optical fiber cable for connecting said devices, said cable having at least one optical fiber and means for conducting heat away from said optical fiber.

4,802,731

OPTICAL WAVEGUIDE ARRANGEMENT FOR A HIGH-VOLTAGE INSULATOR

Martin Maschek, Wiirenlos; Georg Mastner, Niederrohrdorf, and Branko Tomic, Oberehrendingen, all of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Oct. 22, 1987, Ser. No. 111,350
Claims priority, application Switzerland, Oct. 24, 1986, 4243/86
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 12 Claims



1. Optical waveguide arrangement for a high-voltage insulator, particularly for a current transducer of a high-voltage outdoor installation, comprising:
(a) at least one optical waveguide which leads from a high-voltage side of the high-voltage insulator to its low-voltage side;
(b) an optical waveguide support around which the at least one optical waveguide is spirally conducted;
(c) the optical waveguide support having a surface leakage path (k) the length of which is greater than 1.5-times the height (h) of the high-voltage insulator; and
said support comprising an insulating coil and the at least one optical waveguide being conducted positionally stably through said insulating coil, which is located in the hollow space of the high-voltage insulator, the optical waveguide wound around said coil with a steep pitch.

4,802,732

OPTICAL FIBER CABLE PREVENTING WATER FROM SPREADING TOWARD CABLE INTERIOR

Masumi Fukuma, and Nobuhiro Akasaka, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 21, 1987, Ser. No. 98,839
Claims priority, application Japan, Sept. 19, 1986 61-221384, May 13, 1986 62-116659
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 9 Claims

1. An optical fiber cable comprising:
an optical fiber unit comprising:
a rod-like spacer formed with a plurality of grooves at its outer peripheral surface, and
at least one optical fiber tape disposed in each of said grooves; and,
at least one water blockage tape disposed in each of said grooves of said spacer in said unit together with said optical fiber tape, said water blockage tape comprising,
a film like flexible base member, and a water absorbing and swelling member bonded to at least one surface of said base member, said water absorbing and swelling member is formed of a cross-linked polyethylene oxide comprising,
polyethylene oxide having average molecular weight of not less than 20,000; and
one of two functional cross linking agent and three functional cross linking agent, having 0.1 to 1% by weight relative to said polyethylene oxide.

4,802,733

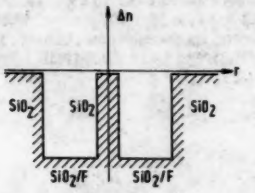
FLUORINE-DOPED OPTICAL FIBRE AND METHOD OF MANUFACTURING SUCH FIBRE

Peter K. Bachmann; Peter E. E. Geittner; Dieter Leers, and Howard J. C. Wilson, all of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Dec. 30, 1985, Ser. No. 814,842
Claims priority, application Fed. Rep. of Germany, Nov. 1, 1985, 3500672
Int. Cl.[4] G02B 6/00, 6/10; C03C 25/02
U.S. Cl. 350—96.34 15 Claims

1. An optical fiber comprising:
a light-transmitting core having a thermal expansion coefficient, said core consisting essentially of silicon dioxide doped with a uniform concentration of fluorine and doped with a uniform concentration of a material which increases the thermal expansion coefficient of the core; and
a cladding surrounding the core, said cladding having a thermal expansion coefficient less than the thermal expan-

sion coefficient of the core, said cladding consisting essentially of silicon dioxide doped with a uniform concentra-



tion of fluorine, the concentration of fluorine in the cladding exceeding the concentration of fluorine in the core.

4,802,734

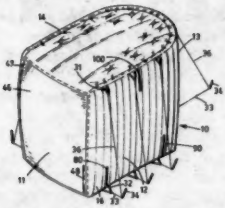
COLD STATIC BALLOONS

Forey Walter, S. 3722 Ridgeview Dr., Spokane, Wash. 99206

Filed Oct. 9, 1987, Ser. No. 106,266

Int. Cl.[4] G03B *21/56*; E04B *1/34*; E04G *11/04*

U.S. Cl. 350—117 **8 Claims**



1. In inflatable screen comprising, a flexible cold air balloon envelope, a screen panel of white material forming one end of said balloon envelope, a blower means connected to said balloon envelope to inflate it, and a projector mounted so as to project display material onto said screen panel which can be observed external of said balloon envelope, and including strips with opposite ends connected to said top and bottom.

4,802,735

LIGHT VALVE PROJECTOR HAVING AN IMPROVED BAR PLATE CONFIGURATION

Thomas T. True, Camillus, and William E. Good, Liverpool, both of N.Y., assignors to General Electric Company, Philadelphia, Pa.

Filed Apr. 10, 1986, Ser. No. 849,990

Int. Cl.[4] G02B *27/42*, *27/00*; H04N *9/31*

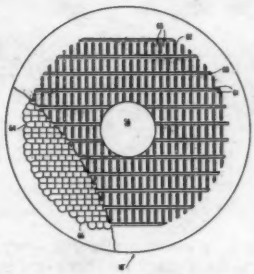
U.S. Cl. 350—162.12 **4 Claims**

1.

A light valve projector of the Schlieren dark field type having improved input and corresponding output bar plate systems wherein the optical input pupil comprises:

a lenticular lens system including a first array of lenslets arranged in rows and a second array of lenslets arranged in columns, the columns disposed orthogonal the rows, wherein the columns of lenslets are periodically interrupted by a respective row of lenslets for segmenting the columns of lenslets and further wherein proximate rows of lenslets are separated by segments of the columns of lenslets, the lenslets of the first array having a first predetermined dimension along the direction of the row and the lenslets of the second array having a second predetermined dimension along the direction of the row wherein the first and second predetermined dimensions are equal, said first array of lenslets in said rows being displaced along the direction of the row a predetermined distance from a predetermined end point of the second predetermined dimension with respect to a predetermined end point of the first predetermined dimension, wherein the predetermined distance is equal to one half the first predetermined dimension;

an input bar plate having row slots and associated row bars and column slots and associated column bars, the row slots and associated row bars disposed orthogonal the column slots and associated column bars, and the row



slots and associated row bars aligned with said first array of lenslets, and further the column slots and associated column bars aligned with said second array of lenslets, in which said row slots and associated row bars are continuous and spaced apart transverse the column slots and associated column bars which are discontinuous for accommodating the row slots and associated row bars; and

light filtering means for passing one color through the row slots and another color through the column slots.

4,802,736

INTERFEROMETERS

Keith Gardner, Foxton; Robert J. Longman, Coton; Robert M. Pettigrew, Foxton, and Walter T. Welford, London, all of United Kingdom, assignors to Plasmon Data Systems, N.V., Curaco, Netherlands Antilles

PCT No. PCT/GB86/00101, § 371 Date Dec. 11, 1986, § 102(e) Date Dec. 11, 1986, PCT Pub. No. WO86/04997, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 25, 1986, Ser. No. 925,806

Claims priority, application United Kingdom, Feb. 25, 1985, 8504772; Jul. 10, 1985, 8517428

Int. Cl.[4] G02B *27/00*

U.S. Cl. 350—163 **12 Claims**

12. An interferometer which comprises:

a single, coherent light source;

a first converging lens positioned on the optical axis of said coherent light sources;

means including a beam-splitting arrangement positioned on said optical axis and spaced from said first converging lens by a distance greater than the focal length of said lens for splitting the light beam into two laterally spaced beams;

a second converging lens positioned on said optical axis to receive and to focus the two beams emanating in use from the beam-splitting arrangement;

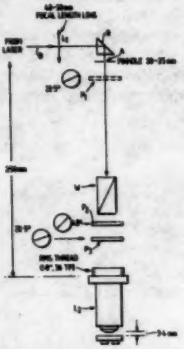
means including a mirror arrangement positioned so that the beams focused by said second converging lens impinge on the mirror arrangement for reflecting said beams to intersect at a focal point with a large angle between the principal rays of the two beams;

said beam-splitting arrangement comprising a Wollaston double image prism and a polarizing arrangement;

said coherent light source constituting a laser generating light of wavelength of about 450 nm or less;

said first converging lens having a focal length of about

40–50 mm and said second converging lens being a microscope objective lens; and



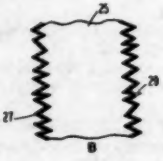
said interferometer including means for arranging the optical elements so that said reflected beams are brought to intersect at an angle of at least 45 degrees.

4,802,737

ANTI-RELFECTION OVERLAY DEVICE

Peter R. Denton, 33 Harrow Gate Dr., Cherry Hill, N.J. 08003

Filed Apr. 28, 1986, Ser. No. 856,709
Int. Cl.[4] G02B 5/28
U.S. Cl. 350—166 6 Claims



1. A transparent overlay means to permit light to be transmitted to an object to be viewed, which overlay means provides protection for said object to be viewed and provides for reducing light reflection as seen by a viewer, comprising in combination:

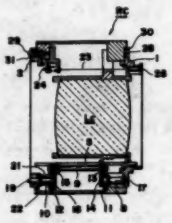
a transparent glass base member having a refractive index and having a depth dimension and having first and second surfaces lying on opposite sides of said depth dimension, said first and second surfaces being roughened surfaces with a plurality of hill-like protrusions and a plurality of valleys lying therebetween, whereby light which is incident thereto is partially transmitted therethrough and partially dispersed to reduce image light reflection as seen by a viewer; and transparent anti-reflection coating secured to both said first and second surfaces in such a manner as to follow said hill-like protrusions, said anti-reflection coating having a refractive index and thickness which provides a light interference phenomenon to light which is incident to said overlay means whereby image light reflection from light incident to said overlay means is reduced by both said light interference phenomenon and by light being partially dispersed.

4,802,738

INTERMEDIATE OPTICAL DEVICE

Makoto Ando, and Hiroshi Kojima, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Feb. 26, 1987, Ser. No. 19,857
Claims priority, application Japan, Feb. 26, 1986, 61-42475
Int. Cl.[4] G02B 7/02; G03B 3/00
U.S. Cl. 350—257 12 Claims



9. An extension device insertable between a camera body having a rotary front coupling on a front wall thereof and an interchangeable lens having a rotary rear coupling complementing and releaseably engageable with said camera body coupling, said extension device including

a rotary front coupling complementing and releaseably engageable with said interchangeable lens coupling and having a front forwardly facing annular positioning surface;

and a rotary rear coupling complementing and releaseably engageable with said camera body coupling and having a rear rearwardly facing annular positioning surface;

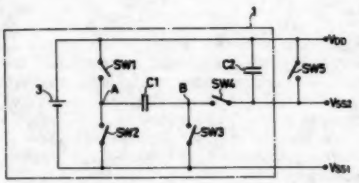
and characterized by having a coupling prevention means including a recess formed in one of said positioning surfaces and an outwardly biased retractable detent disposed in the other of said positioning surfaces, the detent on the extension device engaging the recess in another similar extension device in end-to-end engagement therewith to prevent the relative rotation thereof to full coupling positions.

4,802,739

LIQUID CRYSTAL DISPLAY CONTROL DEVICE

Yoshihiro Iwamoto, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 27, 1986, Ser. No. 833,233
Claims priority, application Japan, Jun. 7, 1985, 60-122805
Int. Cl.[4] G02F 1/13; G06F 3/14; H02M 7/25
U.S. Cl. 350—332 16 Claims



1. A control device for a liquid crystal display unit, comprising:

(a) a boosting circuit having;

a dc power supply,

charging and discharging means,

feeding means for supplying to the liquid crystal display unit a voltage which is necessary to drive and display liquid

crystal by controlling the charge and discharge of said charging and discharging means by selectively coupling said charging and discharging means to said dc power supply, and

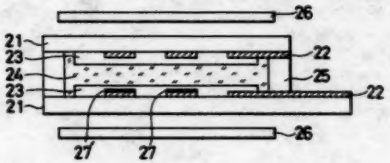
(b) switching means connected to said charging and discharging means for discharging the charges that are accumulated in said charging and discharging means to prevent erroneous display on the liquid crystal display unit when a power interruption occurs.

4,802,740

LIQUID CRYSTAL ALIGNMENT LAYER CONTAINING POLYVINYL-ALCOHOL AND TITANIUM-ALKOXIDE

Yoshio Hotta; Kenji Ohnuma, and Akihiko Komura, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1986, Ser. No. 828,253
Claims priority, application Japan, Feb. 13, 1985, 60-24540; Feb. 15, 1985, 60-26506; Feb. 15, 1985, 60-26507
Int. Cl.[4] G02F 1/133; C08F 8/00
U.S. Cl. 350—341 7 Claims



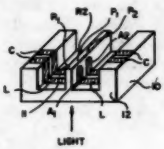
1. A liquid crystal device, which comprises an alignment-controlling film formed by applying on a substrate a water solution comprising polyvinyl alcohol and titanium alkoxide, followed by heating, said titanium alkoxide being contained in a proportion of more than 2 parts by weight and not more than 4 parts by weight per part by weight of polyvinyl alcohol.

4,802,741

IN-DEPTH ELECTRODE LIGHT VALVE ARRAY DEVICES AND IMPROVED FABRICATION METHOD THEREFOR

Joseph Y. Kaukeinen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 9, 1987, Ser. No. 107,230
Int. Cl.[4] G02F 1/03
U.S. Cl. 350—392 10 Claims



1. A light valve array member having discretely addressable electro-optic gates for selectively changing the polarization of light passing therethrough, said member comprising:

(a) a wafer of electro-optic material having opposing major surfaces which are substantially flat and parallel at a modulation zone, said wafer having a pair of spaced parallel grooves of uniform depth which extend into said wafer's thickness from portions of one major surface of said wafer so as to form therebetween, along said modulation zone, a light modulation land portion having opposing, parallel side walls respectively within the depths of said grooves;

(b) a plurality of discrete addressing electrodes deposited on said wafer, said addressing electrodes extending in spaced relation over the walls and bottom surface of a first of said grooves, with intervening wafer portions therebetween, to electrical address connection locations on said wafer; and

(c) reference electrode means deposited on said wafer and extending over the walls and bottom surface of the second of said grooves to an electrical reference connection location(s) on said wafer.

3. A method of making a linear light valve array having a plurality of transversely driven, discretely addressable, electro-optic gates, comprising the steps of:

(a) cutting parallel grooves of uniform depth to form a land region on a wafer of electro-optical material;

(b) holding a stencil having reference and address electrode patterns over said land region and groove portions of said wafer; and

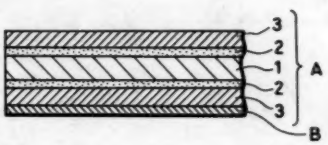
(c) vacuum depositing conductive material through said stencil to form address and reference electrodes on opposing side walls of said land region.

4,802,742

ELECTRODE PLATES FOR LIQUID CRYSTAL DISPLAY PANELS

Rinjiro Ichikawa, Otsu, and Toshio Ishida, Tokyo, both of Japan, assignors to Toyobosaki Kabushiki Kaisha, Osaka and Fujimori Kogyo Co., Ltd., Tokyo, both of, Japan

Filed Sep. 8, 1987, Ser. No. 94,353
Claims priority, application Japan, Sep. 14, 1986, 61-216199
Int. Cl.[4] G02F 1/133
U.S. Cl. 350—339 R 10 Claims



1. In a liquid crystal display panel electrode plate having a transparent electrode on at least one side thereof, which plate comprises a substrate layer comprising an optically non-rotatory transparent film or sheet having a retardation value of not more than 30 nm formed from a polycarbonate resin, polyether sulfone resin, polysulfone resin or polyarylene ester resin, an anchor layer disposed on at least one side of said substrate layer, and one or more protective layers of gas-impermeable resin or/and cured crosslinkable resin disposed on said anchor layer, the improvement wherein said anchor layer is formed from a solution or dispersion of an anchor agent in an aqueous medium, said anchor agent being at least one member selected from the group consisting of polyesters, polyamides, polyurethanes and high molecular weight ion complexes, all of which contain sufficient hydrophilic groups in the polymer segment to achieve solution or dispersion of the polymer in an aqueous medium.

4,802,743

LIQUID CRYSTAL DEVICE HAVING COLOR FILTERS WHEREIN THE COLOR FILTERS FORMED FROM A POLYAMINO RESIN CONTAINING COLORING MATERIALS

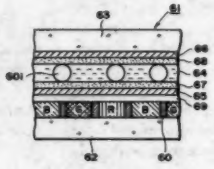
Hideaki Takao; Taiko Motoi, both of Sagamihara; Nobuyuki Sekimura, Kawasaki; Masaru Kamio, and Tatsuo Murata, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1987, Ser. No. 27,308

Claims priority, application Japan, Mar. 20, 1986, 61-060614; Aug. 30, 1986, 61-202745

Int. Cl.[4] G02F 1/13

U.S. Cl. 350—339 F 38 Claims



1. A liquid crystal device comprising a liquid crystal provided between a pair of substrates each having a transparent electrode formed thereon, and a color filter provided on at least one of said substrates, said color filter comprising a film formed from a polyamino resin containing a coloring material dispersed therein.

4,802,744

OPTICAL MODULATION APPARATUS

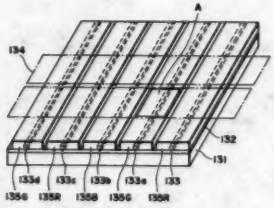
Hitoshi Shindo, Atsugi; Masahiko Ensri, Yokohama, and Mitsutoshi Kuno, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1987, Ser. No. 36,873

Claims priority, application Japan, Apr. 11, 1986, 61-83926; May 26, 1986, 61-119194; Jun. 20, 1986, 61-145614

Int. Cl.[4] G02F 1/13

U.S. Cl. 350—339 F 38 Claims



1. An optical modulation device, comprising:

a first substrate having thereon a first conductor film;

a second substrate having thereon a second conductor film; and

an optical modulation material disposed between said first and second substrates,

wherein at least one of said first and second conductor films has thereon a plurality of low-resistivity transmission electrode lines in electrical contact with said at least one of said first and second conductor films so as to provide a potential gradient along said at least one of said first and second conductor films and intersecting the low-resistivity transmission electrode lines,

wherein at least one of said first and second substrates has thereon a color filter disposed on both sides of at least one of said low-resistivity transmission electrode lines.

4,802,745

LIGHT-POLARIZING FILMS

Toyokazu Okada; Koji Higashi, and Satoshi Taguchi, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

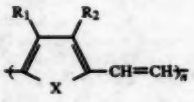
Filed May 26, 1987, Ser. No. 53,656

Claims priority, application Japan, May 23, 1986, 61-119852; Mar. 18, 1987, 62-65161

Int. Cl.[4] G02B 5/30, 27/28; F21V 9/14; G02C 7/12

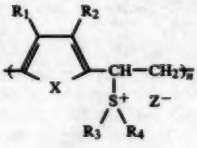
U.S. Cl. 350—397 10 Claims

1. A light-polarizing film as comprising a uniaxially oriented conductive polymer having about 81% or more of a polarizing co-efficient in the wavelength having a minimum transmittance in the range of from 400 to 700 μm, said uniaxially oriented conductive polymer represented by formula (VI)



(VI)

wherein X represents a sulfur atom or an oxygen atom; R_1 and R_2, which may be the same or different, each represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms, a nitrile group, a halogen atom, or a trihalomethyl group; and n represents an integer of at least 5, and, wherein the conductive polymer represented by formula (VI) is obtained from a conductive polymer precursor represented by formula (I):



(I)

wherein X represents a sulfur atom or an oxygen atom; R_1 and R_2, which may be the same or different, each represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms, a nitrile group, a halogen atom, or a trihalomethyl group; R_3 and R_4, which may be the same or different, each represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; Z^- represents an anion; and n represents an integer of at least 5.

4,802,746

VARIABLE-FOCUS OPTICAL ELEMENT AND FOCUS DETECTING DEVICE UTILIZING THE SAME

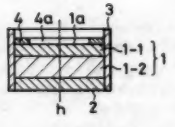
Takeshi Baba, Atsugi; Shigeyuki Suda, Tokyo; Noriyuki Nose, Sagamihara; Eigo Kawakami; Toshiyuki Nakajima, both of Atsugi, and Nobuo Kushibiki, Ebina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,649

Claims priority, application Japan, Feb. 26, 1985, 60-36770; Apr. 16, 1985, 60-80863

Int. Cl.[4] G02B 3/14

U.S. Cl. 350—418 21 Claims



1. A variable-focus optical element comprising:

plural elastic members laminated in the direction of an optical axis; and

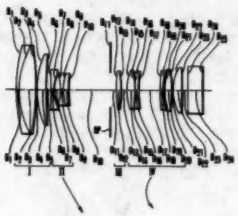
deforming means for deforming said elastic members thereby causing a surface thereof to protrude or retract from a determined aperture; the elastic modulus of a first elastic member positioned at the protruding or retracting side of said plural elastic members being larger than that of a second elastic member neighboring said first elastic member.

4,802,747

COMPACT ZOOM LENS

Akihisa Horiuchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,307
Claims priority, application Japan, Sep. 25, 1986, 61-26539; Sep. 25, 1986, 61-226540
Int. Cl.[4] G02B *15/14, 9/64*
U.S. Cl. 350—427 2 Claims



1. A compact zoom lens comprising:

from front to rear,

a first lens unit having a positive refractive power and axially movable for focusing;

a second lens unit having a negative refractive power and monotonously, axially movable for zooming;

a stop fixed relative to an optical axis;

a third lens unit stationary relative to the optical axis and having a positive refractive power; and

a fourth lens unit to move, while depicting a locus convex toward the front, to compensate for the shift of an image plane resulting from the movement of said second lens unit,

wherein letting the focal length of the i-th lens unit counting from the front be denoted by fi and the shortest focal length of the entire lens system by fw, the following conditions are satisfied:

$2.99 < f_1/fw < 4.08$

$0.88 < |f_2/fw| < 1.21$

$1.75 < f_3/f_4 < 2.42.$

4,802,748

CONFOCAL TANDEM SCANNING REFLECTED LIGHT MICROSCOPE

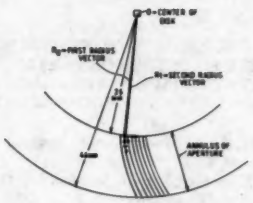
Jon J. McCarthy, Middleton, Wis.; John D. Fairing, Baldwin, Mo., and Jeffrey C. Buchholz, Cross Plains, Wis., assignors to Tracor Northern, Inc., Middleton, Wis.

Filed Dec. 14, 1987, Ser. No. 132,779
Int. Cl.[4] G02B *21/00, 21/06, 26/02*
U.S. Cl. 350—507 5 Claims

1. A scanning device for use in an optical imaging system, comprising:

an opaque disk having apertures formed therein in an annular pattern around the circumference of the disk;

the apertures being distributed within the annular pattern in a series of adjacent arcuate, radially-extending arms defined by radius vectors having their length R_n determined in accordance with the relationship:



$$R_n = \frac{[R_{n-1} + (R_{n-1}^2 + 4K)^{\frac{1}{2}}]}{2}$$

where R_{n-1} is the length of the preceding radius vector and K is a constant,

and their angle T of orientation determined in accordance with the relationship:

$$T = \cos^{-1}(R_n^2 + R_{n+1}^2 - L^2)/(2R_nR_{n+1})$$

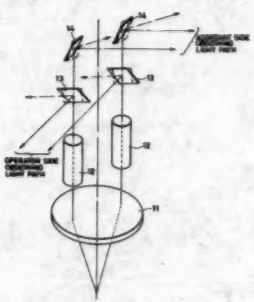
where L is the distance between the ends of the radius vectors.

4,802,749

SURGICAL MICROSCOPE

Takayoshi Togino, Tokyo; Hiroshi Fujiwara, Hachiouji; Yutaka Takabayashi, Hachiouji; Takashi Nagano, Hachiouji; Takashi Fukaya, Ina; Kazuyuki Minami, Musashino, and Toshiyuki Tsunoda, Sagamihara, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1987, Ser. No. 81,333
Claims priority, application Japan, Aug. 6, 1986, 61-183386
Int. Cl.[4] G02B *21/22, 21/36*
U.S. Cl. 350—516 11 Claims



1. A surgical microscope, comprising:

a common objective lens;

a pair of variable magnification optical systems disposed to face each other on the image side of said common objective lens; and

a pair of light beam splitting members disposed on the image side of said pair of variable magnification optical systems, respectively, wherein:

one of two pairs of optical paths split by said pair of light beam splitting members is adapted to be directed to extend in a direction having a predetermined angle other than a right angle relative to a plane containing respective opti-

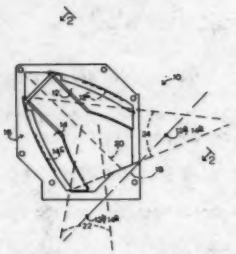
cal axes of said pair of variable magnification optical systems, within a plane crossing at right angles the respective optical axes of said pair of variable magnification optical systems.

4,802,750

REAL IMAGE PROJECTION SYSTEM WITH TWO CURVED REFLECTORS OF PARABOLOID OF REVOLUTION SHAPE HAVING EACH VERTEX COINCIDENT WITH THE FOCAL POINT OF THE OTHER

Steve A. Welck, Santa Monica, Calif., assignor to Grand Mirage, Van Nuys, Calif.

Filed Aug. 3, 1987, Ser. No. 80,761
Int. Cl.[4] G02B *17/06, 5/10, 7/18*
U.S. Cl. 350—619 **4 Claims**



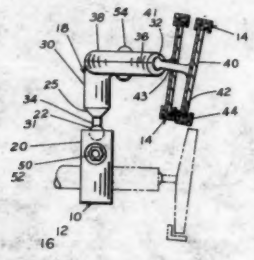
1. A real image projection system comprising
an optical axis extending through a real object zone and a real image zone, and
a pair of paraboloid-of-revolution-segment, compound curvilinear reflective expanses spaced from, and located on one side only of, said axis adjacent said zones, operable, with a real object occupying said real object zone, to create a real image thereof in said real image zone,
said expanses each having a vertex and a focal point defined by the paraboloid-of-revolution associated with each of said expanses, with the vertex of each being substantially coincident with the focal point of the other.

4,802,751

MIRROR ASSEMBLIES WITH UNIVERSAL JOINTS

Ming-Shean Ueng, 1856 Sherman St., Apt. 4, Hollywood, Fla. 33020

Filed Sep. 3, 1987, Ser. No. 93,175
Int. Cl.[4] B60R *1/04, 1/08*; G02B *7/18, 5/08*
U.S. Cl. 350—626 **1 Claim**



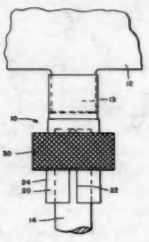
1. A vehicle side viewer to be installed inside a vehicle comprising, two mirror assemblies, a support assembly and adjusting means to rotate each of said mirror assemblies to enable a vehicle driver to see the views in the directions of the rear left and the rear right portions, or in the directions of the left hand and the right hand portions of said driver;
said support assembly comprising a lower support assembly and an upper support assembly;
said lower support assembly having two clamp-halves assembled together by a fastener and a self-locking nut;
said upper support assembly having a lower stem-half and an upper stem-half assembled together by fasteners; said lower stem-half having an universal joint at the lower end, a chamfer to meet a column of larger diameter, and an arc at the top;
said two clamp-halves on said lower support assembly forming a spherical cavity to hold said universal joint on said upper support assembly; and
said lower stem-half and said upper stem-half on said upper support assembly forming a spherical cavity to hold said universal joint on each of said mirror assemblies.

4,802,752

METHOD OF AND APPARATUS FOR MOUNTING A MIRROR TO A ROTATABLE SHAFT

Noah L. Anglin, San Jose, Calif., assignor to Greyhawk Systems, Inc., Milpitas, Calif.

Continuation of Ser. No. 914,347, Oct. 2, 1986, abandoned. This application May 4, 1988, Ser. No. 188,705
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—631 **10 Claims**



1. An apparatus for mounting a mirror formed with a protruding part securely to a rotatable shaft, comprising
an adaptor having a mirror-accepting end part formed with a slot for envelopingly accepting said protruding part and a shaft-accepting part at the opposite end from said mirror-accepting end part, said shaft-accepting part being tubular and slitted with a hollow interior into which an end of said shaft is slidingly insertable and having a tapered exterior surface outside said hollow interior, and
a clamp ring having a tapered inner surface matching said tapered exterior surface of said adaptor, said clamp ring being disposed around said tubular shaft-accepting part and slidable along said tapered exterior surface parallel to said shaft so as to secure said adaptor to said shaft with said shaft inserted into said hollow interior.

4,802,753

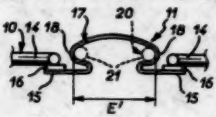
EYEGLASS FRAME WITH RESILIENT BRIDGE

Bernard Lhospice, Blois, France, assignor to Essilor International Cie Generale d'Optique, Creteil Cedex, France

Filed Sep. 9, 1987, Ser. No. 95,005
Claims priority, application France, Sep. 15, 1986, 86 12842
Int. Cl.[4] G02C *5/06, 5/02, 5/12*
U.S. Cl. 351—88 **11 Claims**

1. An eyeglass frame comprising two surrounds, each of said surrounds being adapted to receive a respective lens, a resilient bridge linking said surrounds to permit relative movement of the surrounds and the frame to adapt to a wearer's face, said resilient bridge comprising a strip spring of omega-shaped

cross-section, said spring having opposed lateral lugs attached to the respective surrounds, a middle part and a generally converging connecting zone connecting the middle part to



each of said lateral lugs, a nose-side support means being clipped to said bridge and comprising a U-shaped support member having two branches, each of said branches being held in engagement with a respective one of said connecting zones.

4,802,754

SOFT-PAD SYSTEM FOR A SPECTACLE FRAME

Heinz Neef, Stuttgart, Fed. Rep. of Germany, assignor to Marwitz & Hauser GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 2, 1987, Ser. No. 34,283
Claims priority, application European Pat. Off., Apr. 2, 1986, 86104464.2
Int. Cl.[4] G02C 5/12
U.S. Cl. 351—138 9 Claims

1. A soft-pad system for a spectacle frame to be worn on the nose of a wearer, the nose having nose flanks and the spectacle frame having two pad legs in the region of the nose flanks of the nose of the wearer, the soft-pad system comprising:

said pad legs having respective recesses formed therein;

two pads each of which has a bearing front surface for supporting the spectacle frame on the nose flank of the wearer and a rearward surface opposite said front surface;

each of said pads further having different thicknesses at respectively different locations between said surfaces so as to permit said bearing front surface to be adapted to the form of the nose flank of the wearer;

said pads being inserted into corresponding ones of said recesses so as to cause substantially the entire rearward surface thereof to be in full contact engagement with respective ones of said pad legs so as to be fully supported thereagainst thereby preventing an unwanted deformation of said pads when the spectacle frame is worn by the wearer; and,

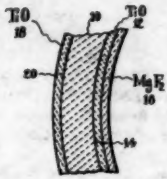
each of said recesses having a predetermined depth; each of said pads having a cross-sectional thickness at one location thereon which is less than at other locations of said pad; and, said cross-sectional thickness at said one location being greater than said depth of the recess accommodating said pad to permit the adaption of one and the same spectacle frame to different anatomical characteristics of the face of the person wearing the spectacles.

4,802,755

DUAL PURPOSE SUNGLASS LENS HAVING GOLD APPEARANCE AND METHOD OF MANUFACTURE

J. Raymond Hensler, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 6, 1987, Ser. No. 34,511
Int. Cl.[4] G02C 7/10; G02B 5/23
U.S. Cl. 351—163 6 Claims



1. A dual purpose sunglass lens having a gold appearing surface, comprising:

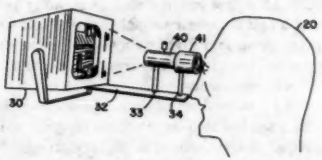
a photochromic sunglass lens having titanium monoxide coatings deposited on the concave and convex surfaces thereof and a magnesium fluoride coating deposited onto the titanium monoxide coating applied to the concave surface, said sunglass lens having a gold appearing surface color and a transmittance of approximately 10% at 20° C. and a transmittance of approximately 5% at 0° C. in bright sunlight.

4,802,756

LOW VISION APPARATUS AND DEVICE AND METHOD FOR ENABLING THE VISUALLY HANDICAPPED TO VIEW TELEVISION

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., Ronkonkoma, N.Y.

Filed Feb. 9, 1987, Ser. No. 12,627
Int. Cl.[4] A61B 3/00; H04N 7/00
U.S. Cl. 351—200 10 Claims



1. A method for enabling a visually handicapped person to view a television screen with resolution and to view the entire screen, said person having a visual handicap requiring the wearing of an optical aid which undesirably limits said person's field of view where the magnification of the optical aid as worn by said person requires said person to position the eye of said person when accommodating the optical aid very close to said screen which therefore severely restricts said person's field of view, the method herein permitting said person to view said screen at a convenient distance when said person is accommodating said optical aid, comprising the steps of:

placing an assembly in front of said screen at a distance to provide a complete image of said screen at a reduced size, with said reduced size image substantially occupying the field of view of said person as determined by said optical aid as accommodated,

inverting said reduced image to enable said person to view said reduced image via said optical aid at a convenient distance with said reduced image substantially occupying said person's entire field of view as limited by said aid to

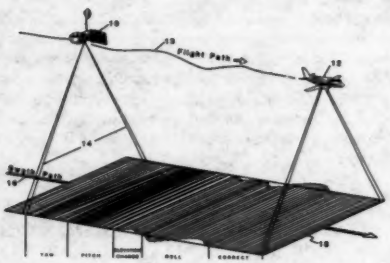
enable said person to view said screen with optimum resolution.

4,802,757

SYSTEM FOR DETERMINING THE ATTITUDE OF A MOVING IMAGING SENSOR PLATFORM OR THE LIKE

Peter K. Pleitner, and Robert K. Vincent, both of Ann Arbor, Mich., assignors to GeoSpectra Corporation, Ann Arbor, Mich.

Filed Mar. 17, 1986, Ser. No. 840,332
Int. Cl.[4] H01V *39/12*
U.S. Cl. 356—2 23 Claims



1. A method of determining changes in the yaw, pitch, roll or elevation of an airborne sensor which moves along a flight path above the earth and records successive two-dimensional images of the earth's surface along said flight path, comprising the steps of:

(A) generating a first set of data representing picture elements of a first two-dimensional image of said surface at a first point along said flight path such that the data representing all of the picture elements of said first image are generated simultaneously;

(B) generated a second set of data representing picture elements of a second two-dimensional image of said surface at a second point along said flight path closely spaced from said first point such that at least a portion of said images overlap each other, and wherein the data representing all of the picture elements of said second image are generated simultaneously,

said picture elements varying in intensity in accordance with their respective locations on the corresponding images, the corresponding picture elements of the first and second images in the overlapping portions thereof being offset from each other by an amount related to changes in the yaw, pitch, roll or elevation of said sensor;

(C) correlating a plurality of corresponding picture elements of the first and second images in the overlapping portions thereof, the relative positions of the correlated picture elements representing the changes in the yaw, pitch, roll or elevation of said sensor, and wherein

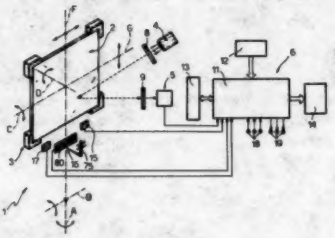
the step of correlating is performed at least in part by selecting at least three spaced apart N×M arrays of picture elements in one of said images, selecting at least three spaced apart reference picture elements in the other of said images which are respectively associated with said at least three N×M arrays, and comparing the at least three reference picture elements with the picture elements in the associated N×M arrays.

4,802,758

DEVICE FOR QUALITY CONTROL OF HOLOGRAMS

Bruno Fabbiani, Via Feletto, 17, 10155 Torino, Italy

Filed Apr. 28, 1987, Ser. No. 43,639
Claims priority, application Italy, Apr. 30, 1986, 67388 A/86
Int. Cl.[4] G03H *1/02*
U.S. Cl. 356—71 22 Claims



1. Device for verifying the authenticity and quality control of a hologram with respect to a sample hologram comprising:

means of support for said hologram, said support means comprising a framework;

means for emitting electromagnetic radiation incident upon said hologram;

said support means and said emitting means having at least three degrees of freedom with respect to each other;

analog means for detecting the electromagnetic radiation corresponding to images reconstructed from said hologram during use;

means for processing signals emitted by said detecting means in at least two predetermined relative positions assumed during use by said support means, radiation emitting means, and detecting means; said processing means comprising memory means in which reference signals, taken from said sample hologram in the same positions in which said reference signals are received from said hologram, are stored;

a processing unit which compares said stored signals with said received signals to make a determination if said stored signals and said received signals are identical; and

an output unit which is connected to said processing unit to display results of said determination made by said processing unit.

4,802,759

THREE-DIMENSIONAL SHAPE MEASURING APPARATUS

Goro Matsumoto, 5-10-6-1, Sumikawa, Minami-ku, Sapporo-shi, and Koichi Shimizu, Sapporo, both of Japan, assignors to Goro Matsumoto, Sapporo and Hitachi Medical Corporation, Tokyo, both of, Japan

Filed Aug. 6, 1987, Ser. No. 82,815
Claims priority, application Japan, Aug. 11, 1986, 61-188321
Int. Cl.[4] G01B *11/24*
U.S. Cl. 356—376 16 Claims

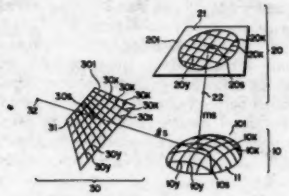
1. A three-dimensional shape measuring apparatus for determining three-dimensional coordinates on an outer surface of a three-dimensional object when placed in a space measured by a three dimensional coordinate system comprising:

a projection device comprising a single projection plane of known three-dimensional coordinates and having a plurality of grating lines wherein at least some of said grating lines cross each other thereby constituting a grating pattern, and a light source of known three-dimensional coordinates for illuminating, through said projection plane, said object -dimensional located at an arbitrary position in the same three

an observation device having a single viewing point and comprising a lens system having an optical center, an

observation plane of known three-dimensional coordinates and a specific point of known three-dimensional coordinates corresponding to the optical center of the lens system, said specific point being located between said observation plane and said object; and

means for determining the three-dimensional coordinates of an arbitrary sample point on one of the projected grating



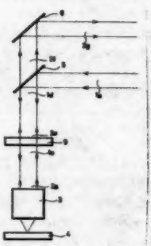
lines of the grating pattern on said object, said sample point on said object being the intersection of a line defined by a light ray emitted from said light source of said projection device and illuminating said sample point on said object and a line including said specific point of said observation device and the image of said sample point in said observation plane, thereby measuring the three-dimensional shape of the object.

4,802,760

RAMAN MICROPROBE APPARATUS FOR DETERMINING CRYSTAL ORIENTATION

Yasuo Inoue, Itami, and Takeshi Ikeda, Hachioji, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1988, Ser. No. 143,401
Claims priority, application Japan, Mar. 25, 1987, 62-72247
Int. Cl.[4] G01J *3/44*; G01N *21/65*
U.S. Cl. 356—31 **2 Claims**



1. A Raman microprobe apparatus for determining crystal orientation, comprising:

a half mirror for deflecting circularly polarized incident light toward a specimen,

a polarizer for selecting linearly polarized incident light from the defected incident light, and

an object lens system for focusing the linearly polarized incident light onto the specimen,

wherein Raman light scattered from the specimen is collected as a Raman light beam by the object lens system and linearly polarized by the polarizer before it is transmitted through the half mirror.

4,802,761

OPTICAL-FIBER RAMAN SPECTROSCOPY USED FOR REMOTE IN-SITU ENVIRONMENTAL ANALYSIS

John M. Bowen; Patrick J. Sullivan; M. Sterling Blanche; Michael Easington, and Lewis J. Noe, all of Laramie, Wyo., assignors to Western Research Institute, Laramie, Wyo.

Filed Aug. 31, 1987, Ser. No. 93,093
Int. Cl.[4] G01J *3/44*; G01N *1/10*
U.S. Cl. 356—301 **17 Claims**

1. A method for remote in-situ detection of at least one compound of interest in liquids or gases comprising:

introducing a collecting cell into the liquid or gas;

said collecting cell comprising a tube having a top and a bottom;

an optical fiber bundle at the top of said tube, a filter at the bottom of said tube, and a protective cap covering said tube;

obtaining at least one Raman spectrum for the compound of interest in the liquid or gas;

carrying the Raman signal obtained through optical fibers to a sensing device remote from the site of the liquid or gas; and

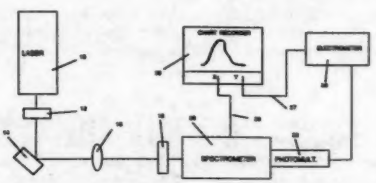
reading the sensing device to detect the presence or amount of the compound of interest.

4,802,762

OPTICAL INSPECTION OF POLYMER-BASED MATERIALS

Ralph H. Hill, Jr., San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Oct. 14, 1986, Ser. No. 917,959
Int. Cl.[4] G01J *3/30*; G01N *21/64*
U.S. Cl. 356—318 **11 Claims**



1. A method for detecting the deterioration of a specimen of polymer-based material, comprising the steps of:

obtaining a reference data signal corresponding the the intensity of fluorescent radiation emitted by a reference sample of said polymer-based material when exposed to light having a particular first wavelength, said reference sample of said polymer material having a known physical condition;

illuminating said specimen of said polymer material with light having a wavelength corresponding to said particular first wavelength;

detecting fluorescent radiation produced by said specimen

after illumination by said light and producing an second data signal in response thereto; and

comparing said second data signal to said reference data signal to obtain an indication of the physical condition of said specimen.

4,802,763

MEASURING APPARATUS FOR CHARACTERIZING A SURFACE HAVING COLOR DIRECTIONAL REFLECTANCE PROPERTIES

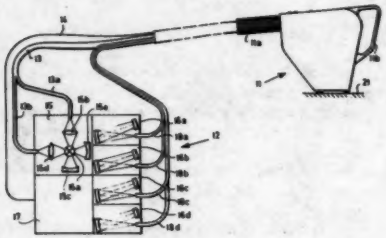
Hermann Gerlinger, Aalen-Ebnat; Gerhard Hohberg, Aalen-Dewangen, and Horst Schneider, Königsbronn, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,151

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 8704679[U]

Int. Cl.[4] G01J 3/36, 3/42; G01N 21/47

U.S. Cl. 356—319 13 Claims



1. A measuring apparatus for characterizing a surface having color directional reflectance properties, the measuring apparatus comprising:

a freely movable measuring head having a head housing;

a stationary base unit;

said stationary base unit including a base housing; and, a light source mounted in said base housing;

first light conductor means for conducting light from said light source to said measuring head;

light directing means mounted in said measuring head for directing said light onto the surface having said properties;

a plurality of receiving optics arranged in said head housing for receiving the light reflected from said surface;

second light conducting means for conducting the reflected light to said base unit; and,

said base unit further including a plurality of diode-array spectrometers for receiving the reflected light from corresponding ones of said receiving optics.

4,802,764

DIFFERENTIAL PLANE MIRROR INTERFEROMETER HAVING BEAMSPLITTER/BEAM FOLDER ASSEMBLY

Peter S. Young, 307 Cherry Hill Rd., Middlefield, Conn. 06455, and Gary E. Sommargren, 119 Neck Rd., Madison, Conn. 06443

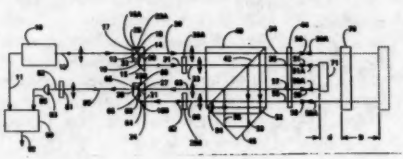
Continuation of Ser. No. 845,925, Mar. 28, 1986, abandoned. This application Aug. 28, 1987, Ser. No. 91,354

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—349 36 Claims

1. A differential plane mirror interferometric system comprising: a pair of plane mirrors separable by a variable optical path length; source means for emitting an input beam comprising two stabilized orthogonally polarized optical frequencies having a frequency difference, said source means further comprising means for providing an electrical reference signal corresponding to said frequency difference between said two stabilized optical frequencies; means optically coupled to said input beam for converting said input beam into two separated parallel orthogonally polarized beams; means optically disposed in the path of one of said two separated parallel orthogonally polarized beams for converting said two separated parallel orthogonally polarized beams into two separated parallel beams having the same polarization; means optically coupled to said two separated parallel same polarized beams for causing one of said two separated parallel same polarized beams to be reflected twice by one of said pair of plane mirrors and the other of said two separated parallel same polarized beams to be reflected by the other of said pair of plane mirrors to produce two parallel output beams having the same polarization; means optically disposed in the path of one of said two separated same polarized parallel output beams for converting said two separated same polarized parallel output beams into separated orthogonally polarized parallel output beams; means optically coupled to said two separated parallel orthogonally polarized output beams for converting said two separated parallel orthogonally polarized output beams into a single output beam having a pair of orthogonally polarized frequency compo-



nents, with a phase difference therebetween being directly proportional to said variable optical path length between said pair of plane mirrors; means optically coupled to said single output beam for mixing said orthogonally polarized components thereof and producing an electrical measurement signal therefrom; and means operatively connected to said electrical measurement signal and said electrical reference signal for indicating a difference in phase between said electrical reference signal and said electrical measurement signal, said indicated phase difference being proportional to said variable optical path length between said pair of plane mirrors; whereby an optical configuration extremely insensitive to measurement error and misalignment is provided for said interferometric sytem, said means for converting said input beam into two separated parallel orthogonally polarized beams comprising a beamsplitter/beam folder assembly means, said beamsplitter/beam folder assembly means comprising a first set of regions of antireflection and polarizing coatings, said means for converting said input beam into said parallel orthogonally polarized output beams comprising said beamsplitter/beam folder assembly means first set of regions and coatings.

4,802,765

DIFFERENTIAL PLANE MIRROR HAVING BEAMSPLITTER/BEAM FOLDER ASSEMBLY

Peter S. Young, and Gary E. Sommargren, both of Madison, Conn., assignors to Zygo Corporation, Middlefield, Conn.

Continuation of Ser. No. 873,406, Jun. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 845,925, Mar. 28, 1986. This application Aug. 28, 1987, Ser. No. 91,284

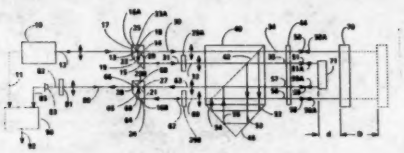
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—349 52 Claims

1. A differential plane mirror interferometric system comprising: a pair of plane mirrors separable by a variable optical path length; source means for emitting an input beam comprising two stabilized orthogonally polarized optical frequencies; means optically coupled to said input beam for converting said input beam into two separated parallel orthogonally polarized beams; means optically disposed in the path of one of said two separated parallel orthogonally polarized beams for converting

said two separated parallel orthogonally polarized beams into two separated parallel beams same polarized beams for causing one of said two separated parallel same polarized beams to be reflected twice by one of said pair of plane mirrors and the other of said two separated parallel same polarized beams to be reflected by the other of said pair of plane mirrors to produce two parallel output beams having the same polarization means optically disposed in the path of one of said two separated same polarized parallel output beams for converting said two separated same polarized parallel output beams into two separated orthogonally polarized parallel output beams; means optically coupled to said two separated parallel orthogonally polarized output beams for converting said two separated parallel orthogonally polarized output beams into a single output beam having a pair of orthogonally polarized frequency components, with a phase difference therebetween being directly proportional to said variable optical path length between said



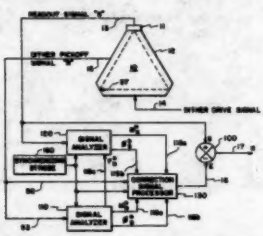
pair of plane mirrors; means optically coupled to said single output beam for mixing said orthogonally polarized components thereof and producing an electrical measurement signal therefrom; and means operatively connected to said electrical measurement signal for extracting a difference in phase from said electrical measurement signal, said extracted phase difference being proportional to said variable optical path length between said pair of plane mirrors; whereby an optical configuration extremely insensitive to measurement error and misalignment is provided for said interferometric system, said means for converting said input beam into two separated parallel orthogonally polarized beams comprising a beamsplitter/-beam folder assembly means, said beamsplitter/beam folder assembly means comprising first set of regions of antireflection and polarizing coatings, said means for converting said input beam into said separated parallel orthogonally polarized output beams comprising said beamsplitter/beam folder assembly means first set of regions and coatings.

4,802,766

DITHER SIGNAL REMOVER FOR A DITHERED RING LASER ANGULAR RATE SENSOR

Merle E. Lundeen, Largo, and Wesley C. Sewell, Dunedin, both of Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 23, 1986, Ser. No. 945,604
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 **9 Claims**



1. A dithered angular rate sensor comprising:

means for generating counter-propagating waves along a closed-loop path, each of said waves having a frequency related to the rotation of said sensor;

means for dithering the frequency of at least one of said waves;

means for producing a dither reference signal related to said dithering;

readout means responsive to said waves for producing a readout signal indicative of rotation of said sensor, said readout signal including a dither signal component due to said dithering;

first signal analyzing means for performing a frequency analysis of said dither reference signal and providing frequency component information descriptive of said dither reference signal;

second signal analyzing means for performing a frequency analysis of said readout signal and providing frequency component information descriptive of said readout signal; and

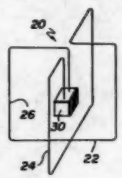
signal processing means for deriving a correction signal representative of said dither signal component in said readout signal from (i) said frequency component information descriptive of said dither reference signal and said readout signal, and (ii) said dither reference signal.

4,802,767

METHOD AND APPARATUS FOR OPTICAL NUTATION SENSING

Warren J. Jasper, Raleigh, N.C., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 2, 1986, Ser. No. 881,433
Int. Cl.[4] G01B *9/02*; G01C *19/64*
U.S. Cl. 356—350 **9 Claims**



1. A nutation sensor for sensing nutation in a spin stabilized satellite having a transverse angular momentum vector comprising:

coil means for restraining the path of a beam of energy, said coil means including a coil of optic fiber having two substantially orthogonal loops each loop lying in a plane substantially normal to said transverse angular momentum vector;

means for providing a first beam of coherent energy in a first direction along said path and a second beam of coherent energy in a second direction along said path;

means for combining said first and second beams at an output end of said path to form a composite beam; and

means for analyzing the composite beam to provide an output signal representing the nutation of said satellite with respect to a frame of reference.

4,802,768

TWO LIGHT SOURCE REFERENCE SYSTEM FOR A FLUOROMETER

Charles R. Gifford, Foster City, and Achille M. Bigliardi, Woodside, both of Calif., assignors to Sclavo, Inc., Wayne, N.J.

Filed Apr. 11, 1986, Ser. No. 850,944
Int. Cl.[4] G01N *21/64, 21/05*
U.S. Cl. 356—417 **18 Claims**

1. An apparatus comprising:

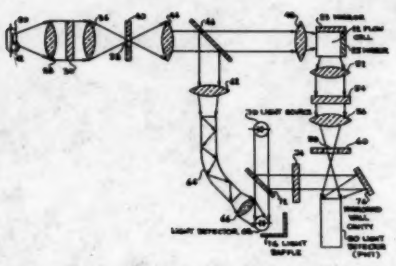
an arc light means having electrodes, for exciting a variable unknown and very small quantity of fluoroescent dye chemically attached to a material being assayed with

intense excitation pulses of light generated from an arc occurring between said electrodes, said excitation light pulses having at least some wavelengths in the excitation band of said fluorescent dye;

flow cell means for containing said material to which said fluorescent dye molecules are attached, said flow cell having a flat, transparent input window of quartz glass having a shape which is longer in one dimension than the other, said longer dimension having an axis which is parallel to the axis between said electrodes in said arc light means between which said arc appears, said flow cell also having a flat, transparent exit window of quartz glass having a normal which is at right angles to the normal of said input window, said exit window being the path through which fluorescent light emitted by excited dye molecules travels, said flow cell having at least the intersection of said input window and said exit window formed by opaque material so as to block the path of scattered light traveling inside the input window toward said exit window by refraction between the quartz surfaces thereby preventing such scattered light from entering the paths used by light exiting from said exit window;

first mask means in the optical path between said arc light means and said input window for limiting the image of the arc from wandering on the surface of said flow cell outside the bounds of said input window;

photomultiplier tube means for detecting fluorescent light emitted from said dye in response to said excitation light pulses and for generating signals indicting the intensity of said light emitted from said dye;



means for focusing emitted fluorescent light on said photomultiplier tube means and for allowing only light rays emanating from the interior of said flow cell means and having a frequency in the band of fluorescent light frequencies emanating from excited dye molecules to reach said photomultiplier means and for preventing stray excitation light scattered from the walls of said flow cell means from following the path traveled by said fluoroescent light rays emanating from the inside of said flow cell means;

reference light detector means for detecting the intensity of light pulses shining on a light sensitive surface and for generating an output signal indicating said intensity;

light waveguide means for coupling light from said arc to said reference light detector means and for spatially integrating the image of said arc so that there is no arc image that wanders randomly over said light sensitive surface of said reference light detector means;

reference light source means for supplying pulses of reference light to each of said photomultiplier tube means and to said reference light detector means during the dark intervals between excitation light pulses; and

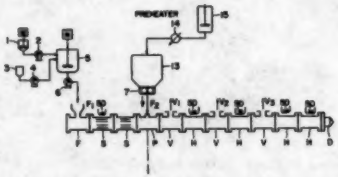
means for calculating a relative fluorescence index from the output signals from said reference light detector means in response to both said excitation light pulses and said reference light pulses and from the output signals from said photomultiplier tube means in response to both emitted fluorescent light pulses and reference light pulses, said relative fluorescence index indicating the amount of fluorescent light being emitted from said flow cell and being compensated for changes in intensity of either the reference light pulses or the excitation light pulses and being compensated for changes in the sensitivity of either said photomultiplier tube means or said reference light detector means.

4,802,769

APPARATUS FOR TREATING THERMOPLASTIC RESIN

Shoichi Tanaka, Numazu, Japan, assignor to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, Fed. Rep. of Germany

Filed Dec. 29, 1986, Ser. No. 947,042
Claims priority, application Japan, Jan. 7, 1986, 61-1149
Int. Cl.[4] B29B *1/10*
U.S. Cl. 366—75 **4 Claims**



1. Apparatus for treating a thermoplastic resin comprising:

means for preparing a diene type graft polymer slurry;

means for evaporating off vaporizing component from an acrylonitrile-styrene copolymer;

a cylinder constituted by a feed barrel, a standard barrel having longitudinal slits for removing vaporized component, a press-in barrel and a plurality of vent barrels, each provided with a vent opening, and a plurality of heating cylinders respectively interposed between said vent barrels;

said barrels being connected together in the order mentioned to form said cylinder;

means for feeding said graft polymer slurry into said feed barrel;

means for feeding under pressure said AS polymer into said press-in barrel;

a double screw contained in said cylinder for kneading and transferring a mixture of said graft polymers slurry and said AS polymer; and

an extruder connected to an end of said cylinder opposite to said feed barrel for extruding a kneaded mixture;

said screw being provided with forward screw in said feed barrel in reverse screws respectively installed in said press-in barrel and said heating barrels for applying back pressures to flows of said graft polymer slurry and said mixture, and a kneading screw installed in said feed-in barrel downstream of said reverse screw in said feed-in barrel.

4,802,770

HIGH PRESSURE MIXING DEVICE

Carlo Fiorentini, Varese, Italy, assignor to Afros S.p.A., Varese, Italy

Filed Aug. 27, 1987, Ser. No. 89,990
Claims priority, application Italy, Sep. 25, 1986, 21815 A/86
Int. Cl.[4] B01F *5/04, 15/02*
U.S. Cl. 366—177 **5 Claims**

1. A high pressure mixing device for mixing a plurality of components comprising:

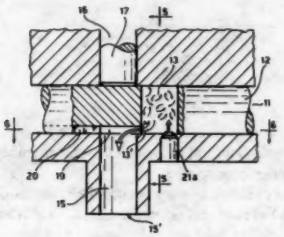
a device body having means therein defining first and second bores extending therethrough so that they intersect one another at a right angle; said first bore comprising a discharge duct having an outlet end;

a first plunger having a constant exterior dimension along its length so as to be in a sliding fit relationship within said first bore;

a second plunger having a sliding fit relationship with said second bore, said second plunger including means defining a through bore dimensioned to slidingly receive said first plunger therethrough;

means for injecting components to be mixed including inlet apertures, said injecting means being positioned so as to have said inlet apertures within said second bore and spaced a predetermined distance from said first bore;

means for moving said first and second plungers in a coordinated manner between advanced and retracted positions, said second plunger being movable between a retracted



position, wherein said through bore is coaxially aligned with said first bore, and an advanced position whereby said through bore has been moved so that said inlet apertures are exposed within said through bore with the components mixing in said area defined by said through bore thereby creating a mixing chamber therein, said second plunger further including means defining a lateral passageway when in its advanced position so that a communication passageway is provided between the interior of said mixing chamber and said discharge duct, said injection means being positioned so that the components are injected in a manner that they flow into the mixing chamber in a direction which is opposite to the direction of flow of the resulting mixture within the discharge duct.

4,802,771

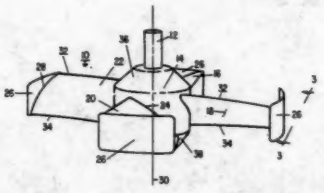
MIXING APPARATUS

Ronald J. Weetman, Rochester, N.Y., assignor to General Signal Corp., Stamford, Conn.

Filed Mar. 31, 1986, Ser. No. 846,372

Int. Cl.[4] B01F *5/12, 7/22*; F04D *29/18*

U.S. Cl. 366—270 **15 Claims**



1. Apparatus for mixing or circulating a liquid or liquid suspension medium which comprises an impeller having a plurality of blades, each of said blades having a tip at the outer end thereof, said blades being rotatable about an axis, said impeller having a diameter which is the diameter of a circle described by the rotation of the tips of said blades about said axis, each of said blades having means for providing a head coefficient k_v from about 3 to 10, at a hydraulic efficiency of at least 40%, where

$$k_v = \frac{H_d}{V^2/2g}$$

where H_d is the pressure head across the impeller, V is the average flow velocity of the medium across the diameter of the impeller, and g is the acceleration of gravity, means for rotating the impeller, said head coefficient being provided by said blades with each of said blades a leading edge, a trailing edge, opposite surfaces, and a base at the inner end thereof, each of said blades having a ratio of the width, measured between the leading and trailing edges thereof, to the diameter of said impeller from 0.30, +0.10 to −0.05 at said tip and 0.25±0.05 at said base, and with a fin disposed at the tip of each of said blades and extending above and below said opposite surfaces about the tip of each of said blades, the tip of each of said blades being arcuate along a sector of a circle centered at said axis, said fins being rectangular plates with upper, lower, forward, and rear edges and which are also arcuate and conforming to the tips on which said fins are disposed, said tips extending diagonally across said fins, and said fins being symmetrically disposed about said tips with the distances between the leading and trailing edges of said blade at said tips and the upper and lower edges of said fins being approximately equal and the distances between the leading and trailing edges of said blades at said tips and said forward and rear edges of said fins also being approximately equal.

4,802,772

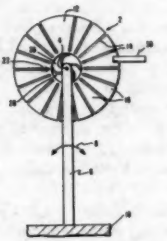
NONELECTRIC TEMPERATURE MONITOR

Richard B. G. Chianese, Altamonte Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 4, 1988, Ser. No. 152,284

Int. Cl.[4] G10K *5/64*

U.S. Cl. 374—205 **10 Claims**



1. Apparatus for monitoring temperature, comprising: a body which experiences a change in shape in response to a change in the temperature of said body; a rotatable device having an axis of rotation and an optical transmissivity which varies circumferentially and radially relative to the axis of rotation; a light conductor device disposed for passing a light beam along a beam axis which intersects said rotatable device at a location spaced from the axis of rotation; means for rotating said rotatable device about the axis of rotation while the light beam impinges on said rotatable device such that said rotatable device permits light to be transmitted therethrough with an intensity which varies in time as a function of the distance between the beam axis and the axis of rotation; and means mounting one of said devices on said body such that a change in the shape of said body in response to a change in body temperature produces a corresponding change in the distance between the axis of rotation and the beam axis.

4,802,773

BAG FOR MAIL AND THE LIKE

Clifford M. Gross, New York, N.Y., assignor to Hospital For Joint Diseases Orthopedic Inst., New York, N.Y.

Continuation of Ser. No. 638,626, Aug. 7, 1984. This application Dec. 30, 1986, Ser. No. 948,446
Int. Cl.[4] B65D *33/06*
U.S. Cl. 383—16 2 Claims

1. A bag for mail and the like, said bag constructed with handles located for minimizing strain on the spine and muscles of a person lifting, carrying or dragging said bag and contents therein, said bag comprising:

(a) a bag body having a body portion in generally cylindrical configuration having an openable end and a closed end, a bottom portion secured to said cylindrical body portion for forming said closed end, said openable end for receiving items stored in said bag;

(b) a plurality of handles individually secured to said body portion in sets of pairs of handles, each handle of each pair of handles arcuately disposed about said body portion diametrically opposite a handle of the same set of pairs of handles, each handle of the same set of pairs spaced arcuately 90 degrees from the adjacent handles of the same set of pairs, said plurality of handles including,

(c) a first set of pairs of handles secured to said body portion proximate said openable end;

(d) a second set of pairs of handles secured to said body portion proximate said closed end;

(e) a third set of pairs of handles secured to said body protion essentially equidistant between said first set of pairs and said second set of pairs, longitudinally;

(f) each handle of said first set of pairs of handles and each handle of said second set of pairs of handles secured to said body so that a circumferential line passing through the length of each handle of the same set of pairs of handles is at normal with the longitudinal axis passing through said generally cylindrical body and a longitudinal line passing through the length of a handle of said third set of pairs of handles is parallel with said longitudinal axis;

(g) one handle of said first set of pairs and one handle of said second set of pairs and one handle of said third set of pairs are essentially in alignment whereby a longitudinal line passing through the length of said one handle of said third set of pairs of handles is perpendicular to a circumferential line passing through the length of said one handle of said first set of pairs of handles and is perpendicular to a circumferential line passing through the length of said one handle of said second set of pairs of handles and the extension of said longitudinal line intersects each said circumferential line at approximately the midpoint of the handle through which the respective circumferential line passes; and,

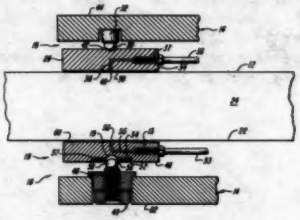
(h) said first set of pairs of handles being spaced from said third set of pairs of handles, longitudinally, a distance which substantially approximates the width of the shoulders of a normal, average size man so that the arms of the person lifting said bag by two adjacent longitudinally separated handles, are essentially parallel.

4,802,774

GAS BEARING FOR GUIDING RELATIVE MOVEMENT OF PRECISION MACHINE PARTS

Vitaly I. Pesikov, Providence, R.I., assignor to Brown & Sharpe Manfacturing Co., No. Kingstown, R.I.

Filed Oct. 14, 1987, Ser. No. 108,143
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—12 19 Claims



1. A system for guiding movement of one member relative to another member comprising:

a first rigid member having first and second opposed generally parallel surfaces which are relatively planar;

a second member, said second member and said first member being relatively movable with respect to one another in a direction generally parallel to said opposed surfaces of said first member;

a first gas bearing disposed in said second member, said first gas bearing having a first bearing shoe with a bearing surface disposed in closely spaced, confronting relation with said first surface of said first member;

a second gas bearing disposed in said second member, said second gas bearing having a second bearing shoe with a bearing surface disposed in closely spaced, confronting relation with said second surface of said first member; and

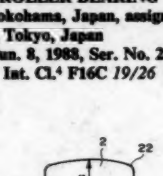
means associated with said second gas bearing for applying a substantially constant force to said second bearing shoe over a range of movement of said second bearing shoe with respect to said second member in a direction generally normal to said second surface of said first member.

4,802,775

ROLLER BEARING

Hirotoshi Takata, Yokohama, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 203,879
Int. Cl.[4] F16C *19/26*
U.S. Cl. 384—450 1 Claim



MAXIMUM CONTACT STRESS DISTRIBUTION

1. A roller bearing comprising an inner race, an outer race and rollers arranged between said outer and inner races, characterized in that radius of curvature (Rk) of a contacting portion between a rolling surface of each of said rollers and a chamfer portion of said roller satisfies the following relationship:

$$0.04\sqrt{Da \cdot lr} \leqq Rk \leqq 0.20\sqrt{Da \cdot lr}$$

wherein Da represents maximum diameter of said roller, and lr represents a length of said roller.

4,802,776

PRINT HEAD HAVING A WEAR RESISTANT ROTATIONAL FULCRUM

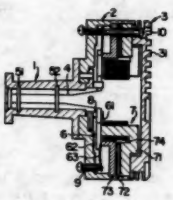
Akiyasu Miyazawa, Toyota; Mineo Harada, Owariasahi; Eiji Tajima, Owariasahi, and Takao Abe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 803,674, Dec. 2, 1985, abandoned, which is a continuation of Ser. No. 540,158, Oct. 7, 1983, abandoned. This application Sep. 1, 1987, Ser. No. 91,756

Claims priority, application Japan, Oct. 15, 1982, 57-179845

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—124 **10 Claims**



1. A print head comprising:

a plurality of printing elements;

a plurality of armatures corresponding to said printing elements for activating said printing elements fixed to one respective end of each of said armatures;

a plurality of resilient members, each being fixed to another respective end of each of said armatures;

a first magnet having magnetic poles, one of said magnetic poles being situated between said one end of armatures and another of said magnetic poles for attracting said armatures such that a closed path for magnetic flux can be established through each of said armatures and said first magnet in contact with each other at said magnetic poles of said first magnet, while resiliently deflecting said resilient members; and

a plurality of second magnets for cancelling the attracting force from said one magnetic pole of said first magnet to actuate said aramatures by the resilient force of said resiliently deflected resilient members;

wherein hardness of a surface of said another magnetic pole is higher than the hardness of an edge at said another end of each of said armatures, each of said another magnetic pole surfaces being in contact with said edge at said another end of each of said armatures so as to form a fulcrum for rotation of said each armature therearound.

4,802,777

PRINT WHEEL AND CARRIAGE DRIVE SYSTEM FOR A PRINTER

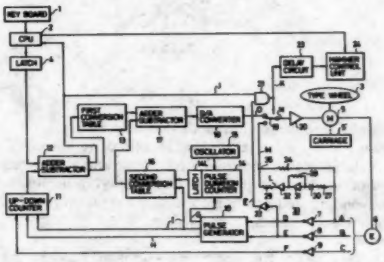
Yasuaki Yamada, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 837,667, Mar. 4, 1986, abandoned, which is a continuation of Ser. No. 629,751, Jul. 12, 1984, abandoned, which is a continuation of Ser. No. 575,720, Feb. 1, 1984, abandoned, which is a continuation of Ser. No. 380,398, May 20, 1982, abandoned. This application Mar. 16, 1987, Ser. No. 27,123

Claims priority, application Japan, Oct. 19, 1981, 56-166611; Oct. 19, 1981, 56-166612

Int. Cl.[4] B41J *1/30*

U.S. Cl. 400—144.2 **28 Claims**



1. A serial printer comprising:

a motor;

a first counter for storing a rotational position of said motor;

a latch for storing a destination position of said motor;

a first operation unit for receiving outputs from said latch and said first counter and for calculating an amount of position error therefrom;

a first conversion table containing target values corresponding to amounts of position error for receiving an output from said first operation unit;

a pulse generator responsive to a rotation of said motor for generating pulse signals;

a second counter for counting reference pulses generated in an oscillator during one cycle of the pulse signals generated from said pulse generator;

a second conversion table containing a plurality of numeric values associated with average velocities delayed by one cycle of the pulse signals for receiving an output from said second counter;

a second operation unit for receiving target values corresponding to amounts of position error from said first conversion table and numeric values associated with average velocities delayed by one cycle of the pulse signal from said second conversion table and for calculating an error signal from said target values and said numeric values;

a D/A converter for converting an output of said second operation unit into an analog signal;

an analog circuit for generating a signal by combining an analog signal generated during a predetermined period in response to the rotation of said motor and a phase-advanced compensation signal; and

a selection switch for temporarily connecting said motor to said analog circuit when said motor reaches a stopping region, said motor otherwise being connected to said D/A converter.

4,802,778

CARRIAGE DRIVE CONTROL DEVICE IN A PRINTING DEVICE

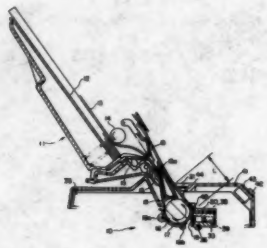
Kiyoshi Takahashi, and Hisaki Okada, both of Aichi, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 8, 1986, Ser. No. 849,396

Claims priority, application Japan, Apr. 9, 1985, 60-74678

Int. Cl.[4] B41O *13/10*

U.S. Cl. 400—624 **5 Claims**



1. A carraige drive control device comprising:

means for supplying a printing sheet having a leading edge;

a rotatable platen means for receiving and supporting said printing sheet supplied by said supplying means and for advancing said printing sheet upon rotation of said rotatable platen means;

a print head;

a carriage means for supporting said print head for bidirectional movement along a printing line parallel to said rotatable platen means;

a paper guide member mounted on said carriage means proximate said print head to confront said rotatable platen means;

a driving means for selectively reciprocating said carriage means along said printing line;

means for determining, upon the end of the printing operation for each line, whether said leading edge of said printing sheet has been advanced beyond said printing line by a predetermined distance; and

drive control means for controlling said driving means and said carriage means to position said print head at a predetermined location in said printing line prior to rotation of said rotatable platen means to advance said printing sheet if said leading edge of said printing sheet has been advanced by a distance less than said predetermined distance.

4,802,779

KEYBOARD

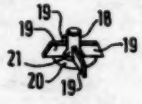
Jean-Luc Allaire, Guichainville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 6, 1987, Ser. No. 118,383

Claims priority, application France, Nov. 14, 1986, 86 15853

Int. Cl.[4] B41J *5/16*

U.S. Cl. 400—496 **5 Claims**



1. A keyboard comprising a chassis with a main section and provided with an elongate key and guide means, said key being slidable along said guide means of said chassis, said keyboard having a handle intended to prevent the key from being depressed obliquely, said handle being pivotable about an axis perpendicular to the sliding direction of said key, said handle being formed of a wire shaft each end of which is folded twice at right angles to form two U-shaped sections each with a pin parallel to the rest of the shaft, said key having two slots perpendicular to said sliding direction, each pin being slidably fitted in an associated slot of said key, said chassis being provided with elastic connection means for mounting said handle, each slot of said key being open at one end in order to permit the entrance of its respective pin, said key being provided with an inclined surface for each slot leading to the opening of its associated slot, each said inclined surface being on the side of said key away from the main section of said chassis, said elastic connection means permitting said pins to follow said inclined surface and to enter each of said slots thereby connecting said key to said chassis, said elastic connection means and said inclined surface forming a releasing means for readily releasing said handle pins from said slots.

4,802,780

PRINTER FRAME STRUCTURE FOR SIMPLIFYING RECORD MEDIUM FEEDING ATTACHMENT

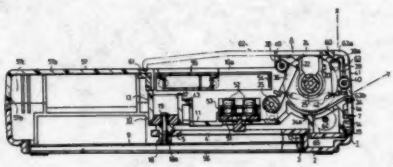
Takeshi Yokoi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 799,753, Nov. 19, 1985, abandoned. This application Nov. 18, 1987, Ser. No. 122,524

Claims priority, application Japan, Nov. 20, 1984, 59-175818[U]; Feb. 5, 1985, 60-014887[U]; May 2, 1985, 60-066064[U]

Int. Cl.[4] B41J *29/02*

U.S. Cl. 400—643 **4 Claims**



1. In a printer comprising:

a frame having an upper cover, and a rear cover member extending generally vertically at the rear end of said upper cover;

said frame further including a main frame having a rear side wall, said rear side wall and rear cover member constituting at least part of a rear cover;

a platen in said frame in close proximity with said upper cover and said rear cover and supported rotatably on an axis parallel to said upper and rear covers;

a carriage movable along said platen in the longitudinal direciton thereof and positioned in said frame on a first side of said platen which is opposite to a second side thereof where said rear cover is located;

a printing head supported on said carriage and facing said platen;

an open area for exposing part of upper and rear surfaces of said platen, formed in a position between said upper cover add said rear cover; the improvement comprising

a paper guide member positioned in said frame,

said paper guide member having a concave arc surface facing the lower surface of said platen and spaced therefrom,

a rear edge of said concave arc surface directly extending above said rear side wall of said main frame so as to be directly connected to said rear cover at the lower edge of said open area,

whereby a first path for printing paper is defined extending in the direction toward said platen from a first portion of said open area formed in said upper cover and a second

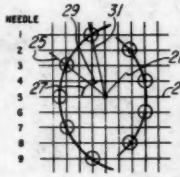
path is defined extending from a second portion of said open area formed in said rear cover.

4,802,781

DOT MATRIX PRINTER HAVING INCREASED IMPACT FORCE AND HIGHER OPERATING FREQUENCY

Thomas J. Sheerer, Troy, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 27, 1987, Ser. No. 89,879
Int. Cl.[4] B41J 3/12
U.S. Cl. 400—124 **12 Claims**



1. A method of positioning print wire actuators for a dot matrix printer, comprising the steps of:

(a) locating in a plane N parallel spaced lines, where N is an odd positive integer;

(b) locating a point on the (N+1)/2 line from an extreme one of said lines;

(c) defining points on a first arc of a circle having a center of curvature in the direction of said point and passing through the odd ones of said N lines at angles of (360 degrees/N)×A with said (N+1)/2 line, where A is an integer from 0 to N;

(d) defining points on a second arc of a circle having a center of curvature in the direction of said point and on the opposite side of said point as said first arc and passing through the even ones of said N lines at angles of (360 degrees/N)×A with said (N+1)/2 line, where A is an integer from 0 to N; and

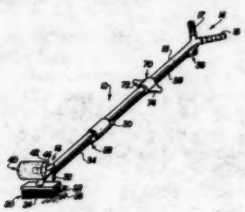
(e) placing print wire actuators at said points.

4,802,782

CLEANING INSTRUMENT FOR CARPETS AND LIKE SURFACES

James Scalf, R.I. Box 525 #85A, Marathon, Fla. 33050

Filed Dec. 16, 1987, Ser. No. 133,840
Int. Cl.[4] A47L 13/12, 13/26
U.S. Cl. 401—138 **10 Claims**



1. A cleaning tool assembly designed to clean and remove stains and the like from a carpet or like surface, said assembly comprising:

(a) a base having an elongated configuration and including a handle means mounted, at least partially, at one end thereof for manipulating said tool assembly,

(b) an agitating means for working the surface being cleaned and secured to an opposite end of said base relative to said handle means and extending outwardly from said base,

(c) a cleaning means for removing fluid from the surface being cleaned and secured to said base at said opposite end and extending outwardly from said base in a different direction than said agitating means,

(d) said cleaning means comprising a support head and a fluid absorbing member secured to said support head and positionable in movable engagement with a surface being cleaned,

(e) said support head pivotally secured to said base and including an elongated support surface reciprocally positionable and engageable with the surface being cleaned upon manipulation of said base and handle means, said support surface comprising a substantially arcuate cross-sectional configuration extending along its length,

(f) said fluid absorbing member comprising a flexible absorbent material cover removably mounted in overlying, exposed and supporting engagement on said support surface,

(g) said fluid absorbing member extending in covering and substantially conforming relation to said support surface and assuming the arcuate cross-sectional configuration thereof and including opposite ends thereof removably connected to said support head outboard in spaced relation to said support surface and being structured for removably connecting opposite ends of said absorbing member, and

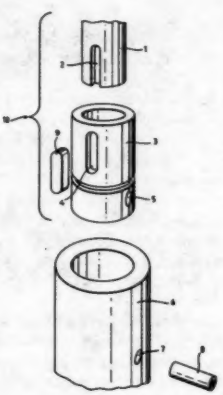
(h) said base and said handle means being cooperatively disposed and configured for reverse orientation relative to the surface being cleaned and positioning of said base being a first and a second operative position respectively defined by said agitating means and said cleaning means being disposed in operative engagement with the surface being cleaned.

4,802,783

SLEEVE JOINT

Magnus Erikson, Johannesbov, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 904,830, Sep. 8, 1986, abandoned, which is a continuation of Ser. No. 672,980, Nov. 19, 1984, abandoned. This application Aug. 27, 1987, Ser. No. 91,291
Claims priority, application Sweden, Nov. 22, 1983, 8306443
Int. Cl.[4] F16B 3/00
U.S. Cl. 403—2 **1 Claim**



1. Sleeve joint apparatus for rotary coupling comprising in combination:

a driven impeller body having a cylindrical portion with a bore and a first aperture therein;

a unitary formed cylindrical sleeve having first and second end portions and a second aperture positioned adjacent said second end portion for alignment and corresponding with said first aperture, said second end portion of said sleeve being inserted and partially accommodated in said bore of said driven impeller body, and said cylindrical sleeve having a slot adjacent said second end portion and angularly displaced from said second aperture;

a driving shaft member having a third end portion being inserted and partially accommodated in said first end portion of said sleeve, said driving shaft member having an axially disposed channel for alignment and corresponding with said slot;

a wedge member for insertion into said slot and channel to form a rotary entraining connection between said driving shaft member and said cylindrical sleeve; and

a shearable driving pin for inserting into said first and second apertures and securing said driven impeller body and said cylindrical sleeve for rotational movement by said driving shaft member,

whereby, when said driven impeller body is prevented from rotational movement, said shearable driving pin will shear and said driving shaft member and unitary formed cylindrical sleeve will continue to rotate.

4,802,784

BI-FLEX PIVOT

John J. Brooks, Santa Ynez, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Mar. 11, 1988, Ser. No. 167,202
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—24 **14 Claims**

1. A structural pivot that substantially eliminates the geometric center shift of its rotating members, said pivot comprising:

a first sleeve having a major axis and an inner surface;

a second sleeve having a major axis and an inner surface, said second sleeve being spaced from the first sleeve;

a first flexure having first and second spaced apart blades joined by a common cross member, each blade having a free end, the free end of the first blade being connected to the inner surface of the first sleeve, while the free end of the second blade is connected to the inner surface of the second sleeve, the blades being connected so that they define a first plane passing through the axes of the sleeves; and

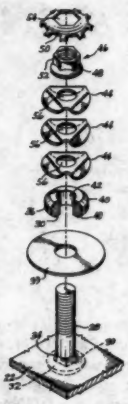
a second flexure member having third and fourth spaced apart blades joined by a second common cross member, the third and fourth blades having free ends, the free end of the third blade being connected to the inner surface of the first sleeve, while the free end of the fourth blade is connected to the inner surface of the second sleeve, the third and fourth blades being connected so that they define a second plane passing through the axes of the sleeves, said second plane being substantially transverse to the first plane.

4,802,785

JOINT CONSTRUCTION AND OVERHEAD HANGER

Peter S. Richards, 100 Mt. Si Pl. NW., Issaquah, Wash. 98027

Continuation-in-part of Ser. No. 811,939, Dec. 20, 1985, Pat. No. 4,667,916. This application May 6, 1987, Ser. No. 47,439
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—27 **30 Claims**



1. A joint construction comprising:

a first member including a cylindrical sidewall defining a socket having an inner surface;

a second member including a connector assembly, said connector assembly comprising an axially-extending stud having a base, a free end and a threaded portion adjacent the free end;

a cam ring at the base of the stud having a base end and an opposite end, said cam ring being smaller in diameter than the inside diameter of said socket, said cam ring including a beveled edge at its opposite end spaced radially outwardly from said stud;

a main locking disk having a central portion with a center opening through which the stud extends, and a plurality of wings spaced around the disk and bent along fold lines to extend towards the edge of the cam ring, said wings having outer grip edges, and said main locking disk having a plan form sized to slip fit into said socket;

a nut threaded onto the threaded portion of the stud outwardly of the main locking disk, said nut including lower stop means at its end nearest the cam ring and a wrench portion extending from said lower stop means in the direction opposite the cam ring, said wrench portion having side wrench surface means;

a nut wing washer having a central opening through which said wrench portion of the nut extends, said opening corresponding in shape to the wrench surface means so that the nut wing washer is secured against rotation relative to the nut, said nut wing washer having a plurality of generally radial wings with outer edges, said nut wing washer having a plan form which is larger than the inside diameter of the socket;

upper stop means for holding the nut wing washer against axial movement off from the nut in a direction away from the lower stop means; and

wherein the first and second members are connected together by an insertion movement of the connector assembly on the second member into the socket of the first member, with such movement causing a bending of the wings of the nut wing washer, attended by the outer edges of such wings gripping the inner surface of the socket and holding the nut wing washer against rotation, followed by a rotation of the second member relative to the first mem-

ber, with the nut wing washer holding the nut in position relative to the first member during such rotation, causing relative axial travel of the nut on the stud towards the cam ring, and with such axial travel causing the beveled edge of the cam ring to push the wings of the main locking disk outwardly, so as to press their outer edges into tight gripping engagement with the inner surface of the socket.

4,802,786

JOIST HANGER

James G. Yauger, Lincoln, and John M. Rushton, Milford, both of Mich., assignors to MiTek Industries, Inc., Creve Coeur, Mo.

Filed Nov. 3, 1987, Ser. No. 116,445
Int. Cl.[4] B65G 3/28
U.S. Cl. 403—232.1 20 Claims

1. An improved joist hanger of the type comprising an upright back, parallel opposing sides forming a channel and a horizontal bottom extending forwardly from the back forming a seat for a joist, the improvement comprising:

at least one pair of opposing tabs extending inwardly from the sides of the hanger into the channel, the tabs presenting downwardly, rearwardly sloping surfaces to a joist forced against the tabs to urge the joist against the back of the hanger.

4,802,787

ELECTRICAL CONTROL SYSTEM

Marvin G. Bays, Ponca City, Okla., assignor to Mertz, Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 940,981, Dec. 12, 1986. This application Oct. 23, 1987, Ser. No. 111,767
Int. Cl.[4] E01C 23/12
U.S. Cl. 404—90 10 Claims

1. Apparatus for controlling the total force being applied to a tool means in contact with a surface comprising:

(a) force generation means;

(b) elastic means having a first and second surface means;

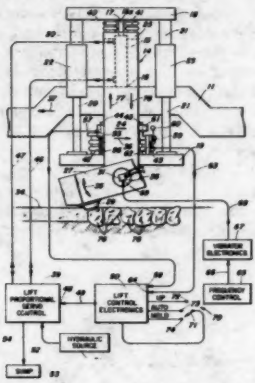
(c) means for coupling said force generation means to said first surface means;

(d) means for coupling said tool means to said second surface means;

(e) means for measuring the distance between said first surface means and said second surface means;

(f) means coupled to said means for measuring the distance for generating an output corresponding to the said measured distance; and,

(g) means responsive to said output, coupled to said force generation means in a manner to regulate the total force generated when said distance measures a preselected amount;



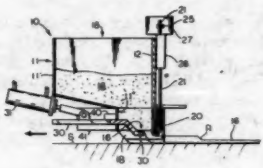
whereby when said elastic means is crushed by a predetermined distance a desired total force is realized.

4,802,788

ROAD MARKING APPARATUS

Martin A. Smith, Atlanta, Ga., assignor to Pave-Mark Corporation, Atlanta, Ga.

Filed Jan. 13, 1988, Ser. No. 143,369
Int. Cl.[4] E01C 23/16
U.S. Cl. 404—94 4 Claims



1. Road marking apparatus comprising a pair of side runners; a hopper mounted upon said pair of side runers in which a fluid marking material may be held, said hopper having front and rear walls joined by side walls with the bottom of said rear wall defining a boundary of an outlet through which fluid marking material may flow out of the hopper and onto the surface of a road between said side runners; a doctor blade means mounted for generally vertical reciprocal movement in sliding contact with the outside of said hopper rear wall adjacent said hopper outlet for varying the thickness of marking material applied to a road surface; and a floor gate mounted for generally horizontal reciprocal movement into and out of sealing engagement with a bottom edge of said hopper rear wall and a surface of the doctor blade facing the floor gate leading edge in closing and opening said hopper outlet.

4,802,789

COMBINED PUNCH AND CLIP

Walter W. Hsu, No. 156, Chen Pei Village, Chen Pei Road, Tou Liu City, Yun Lin Hsien, Taiwan

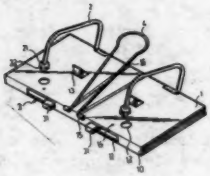
Filed May 12, 1988, Ser. No. 192,911
Int. Cl.[4] B42F 3/04
U.S. Cl. 402—1 3 Claims

1. A combined punch and clip for punching a stack of paper therewith and clipping said stack of paper together thereon,

comprising a base (1), two punching elements (2), two locking apparatuses (3), and a clipping shank (4), wherein:

said base (1) comprises respective horizontal slots (11) provided on left and right sides of a lateral surface (10) of said base for permitting respective said locking apparatuses (3) to protrude therefrom; respective openings (12) are provided proximate to each of said horizontal slots (11); a pair of cylindrical components (15) are mounted on an upper central horizontal portion of said lateral surface (10) of said base (1) for receiving distal ends of said clipping shank (4);

said respective punching elements (2) are mounted at distal ends thereof on left and right sides of said base (1); a punching head (21) is provided on another distal end of each of said punching elements (2) proximate to and insertable in said opening (12); an aperture (22) is disposed at a lateral surface of said punching head (21) and facing said horizontal slot (11) to permit said locking element (3) to be wedged therebetween; and



said respective locking apparatuses (3) are housed in left and right sides of said base (1) and pivotally fixed therein by respective pins (30); respective retarding means (18) mounted on left and right sides of said base (1) are adjacent to each said locking apparatus (3); a spring-loaded controlling element (31) is provided on each of said locking apparatuses (3) and protrudes from said horizontal slot (11) with a spring (32) disposed between said controlling element (31) and said retarding means (18); and a retaining element (37) formed on said locking apparatus (3) is retractable in said aperture (22) of said punching head (21) to lock said punching element (2).

4,802,790

VIBRATING MACHINE FOR EFFECTING TILING

Claudio Tondini, Cotignola, Italy, assignor to Tomecanic, Aubergenville, France

Filed Sep. 30, 1987, Ser. No. 103,774

Claims priority, application European Pat. Off., Oct. 1, 1986, 86402146.4

Int. Cl.[4] E04F *21/22*; E01C *19/28*

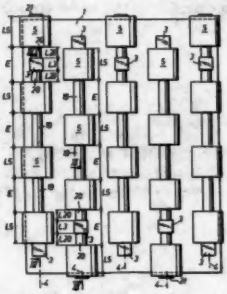
U.S. Cl. 404—132 **4 Claims**

1. In a vibrating machine for applying sandstone or like tiles (16) on a bonding agglomerate (17) disposed between a surface (18) to be covered and said tiles (16), said machine including a frame (1), an assembly of rollers (5) disposed beneath said frame (1) and mounted on parallel shafts (2) with their lower surfaces positioned along a common tangential plane (P), and a vibrating generating device (9) coupled to said frame (1), and wherein each of said shafts (2) is fixed beneath said frame (1) and being stopped in the direction of rotation with respect to said frame (1), said assembly of rollers (5) on each of said shafts (2) being separated, one from the adjacent one, by a distance (E), and each of said rollers (5) being mounted to rotate on said shafts (2), the combination therewith in which

(a) said distances (E) separating adjacent rollers (5) mounted on the same shaft (2) are substantially equal,

(b) substantially all of said rollers (5) are identical and are of a common length (L5), said distances (E) separating two adjacent identical rollers (5) being greater than said length (L5), and

(c) said identical rollers (5) supported on said shafts (2) are disposed substantially in a quincunx pattern so that the



rectilinear traces (T5) capable of being made by said rollers (5) supported by one of said shafts (2) are not convered by the rectilinear traces (T5) capable of being made by said rollers (5) supported by the following of said shafts (2).

4,802,791

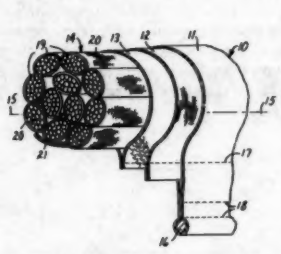
REDEPLOYABLE HIGH TEMPERATURE OIL BOOM

Edward M. Fisher, and Stephen M. Sanocki, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 1, 1987, Ser. No. 103,268

Int. Cl.[4] E02B *15/04*

U.S. Cl. 405—63 **14 Claims**



1. A high temperature oil containment boom comprising an outer layer, a first underlayer of a first knitted wire mesh and a second underlayer of high or intermediate temperature resistant refractory fabric surrounding a cellular, high temperature resistant flotation core, said layers being secured together at least about their peripheral edges.

4,802,792

BUSHINGS FOR JOINING RIGID OBJECTS TO FLEXIBLE MEMBRANES

James D. Flessas, Hinsdale, Ill., assignor to MPC Industries, Inc., Chicago, Ill.

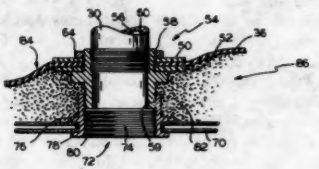
Filed Oct. 17, 1986, Ser. No. 920,717

Int. Cl.[4] F16L *19/00*

U.S. Cl. 405—53 **7 Claims**

1. A bushing for enabling a rigid object to make a sealed penetration of a hole having a first diameter and formed in a membrane of industrial fabric which may be buried in the earth and which is subject to bending forces, said bushing comprising a tubular member having an enlarged collar which has a

diameter that is greater than said first diameter, external threads extending from at least one side of said collar to an end of said member, a pair of smooth surfaced semi-flexible washers having center holes with substantially said first diameter, said washers being positioned on opposite sides of said membrane with said holes aligned and fitting over said external threads, said washers resting on said enlarged collar without



being attached to said membrane in order to distribute said bending forces appearing in the membrane while enabling the membrane to slip relative to said washer in the general areas where said bending forces appear whereby said membrane does not always tend to bend at the same location, and nut means cooperating with said collar for tightly securing said washers on opposite sides of said membrane.

4,802,793

PIPELINE OR CABLE PLOUGH

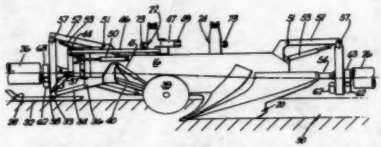
Timothy W. Grinsted, Ovingham, and Alan R. Reece, Wylam, both of England, assignors to Soil Machine Dynamics Limited, Stocksfield, England

Continuation of Ser. No. 911,338, Sep. 25, 1986, abandoned. This application Apr. 19, 1988, Ser. No. 186,708

Claims priority, application United Kingdom, Oct. 3, 1985, 8524410

Int. Cl.[4] F16L *1/04*; E02F *5/02*

U.S. Cl. 405—161 **6 Claims**



1. A plough for entrenching a pipeline comprising first and second portions, each said portion including a plough body part and an elongated chassis component extending ahead of said plough body part, said portions together defining a trough between said chassis components in which trough a pipeline can be received in an elevated position where a seabed, said trough having a base surface beneath the pipeline, said elongate chassis components having respective leading ends, said portions being connected by bridging structure extending actross said trough and the pipeline therein, said plough further comprising means engagable with the underside of the pipeline to prevent damaging engagement between the underside of the pipeline and said base surface of said trough, and further comprising hinge means permitting each of said plough body parts to separate from the other by movement about a hinge axis extending lengthwise of said plough to allow the pipeline to pass between said parts during installation of said plough on the pipeline and removal therefrom, and said bridging structure being spaced rearwardly from said leading ends of said chassis components to allow said plough to execute pitching movements without imposing damaging loads upon the pipeline by engagement with the upper side thereof.

4,802,794

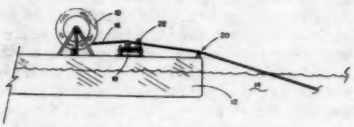
REEL TYPE MARINE PIPE LAYING APPARATUS WITH TENSION INDUCED PIPE STRAIGHTENING

Robert P. Lynch, Tulsa, Okla., assignor to Lyntech Corporation, Tulsa, Okla.

Filed Apr. 30, 1987, Ser. No. 44,355

Int. Cl.[4] F16L *1/04*; B21D *3/04*

U.S. Cl. 405—168 **10 Claims**



1. An apparatus for straightening pipe unwound from and at a point on a reel aboard a floating barge which has a stern which comprises:

a barge stern roller supported by the barge;

tensioning means for applying tension to said pipe as it is unwound from said reel;

said stern roller and said point on said reel defining a straight, targent line;

one and only one straightening roller member between said sern roller and said point on said reel;

support means supporting said straightening rollermember above said tangent line.

4,802,795

PLATEN FIXING APPARATUS

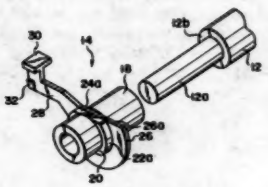
Masaaki Takada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 20, 1987, Ser. No. 110,666

Claims priority, application Japan, Oct. 24, 1986, 61-163252

Int. Cl.[4] B41J *11/04*

U.S. Cl. 400—660 **6 Claims**



1. An apparatus for fixing a platen, comprising:

a. a frame including a pair of parallel supporting plates separated by a specified distance, each of the supporting plates having an upper end edge, a supporting section, and an engaging hole formed near the supporting section, said supporting section having a round supporting hole and a guide hole extending from the supporting hole up to the upper end edge of the supporting plate, said guide hole having a width less than the diameter of the supporting hole;

b. a platen shaft extending coaxially with the platen and having a pair of ends projecting from both ends of the platen;

c. a pair of fixing members for holding both ends of the platen shaft in the supporting sections to support the platen between the supporting plates, each fixing member including:

a cylindrical body into which one end of the platen shaft is rotatably inserted;

an intermediate portion formed at said body and fitted into the supporting hole, the intermediate portion having a

pair of arcuate supporting faces with substantially the same diameter as that of the supporting hole and a pair of guide faces positioned diametrically opposite each other and separated by a distance less than the width of said guide hole;

first stopper means, extending from the body and contacting that side of the supporting plate which faces the platen, for restraining the fixing member from moving toward the supporting plate;

operating means for turning the fixing member between a fixed position in which the supporting faces of the intermediate portion contact the inner surfaces of the supporting hole and a mounting position in which the guide faces of the intermediate portion are aligned with the guide hole so that the fixing member can be pulled out from the supporting hole through the guide hole, said operating means including an operating arm extending radially from the body and elastically deformable in the axial direction of the platen;

restraining means for holding said fixing member in the fixed position, said restraining means including (1) a grip portion formed at the extended end of the operating arm, said grip portion contacting the upper end edge of the supporting plate to restrain the fixing member from rotating in one direction when the fixing member is turned to the fixed position, and (2) a projection formed on the operating arm, said projection engaging the engaging hole of the respective supporting plate to restrain the fixing member from rotating in a direction opposite the one direction when the fixing member is located at the fixed position; and

d. second stopper means at each end of the platen shaft for preventing the fixing member from moving toward the platen.

4,802,796

PRESSURE-REDUCING DEVICE FOR PARTICULATE MATERIAL

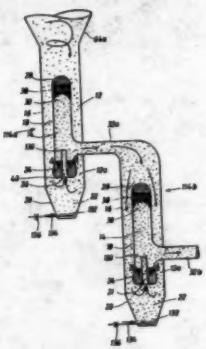
Roine Brännström, Finspong, Sweden, assignor to ASEA-Stal AB, Finspong, Sweden

Continuation of Ser. No. 819,331, Jan. 16, 1986, abandoned. This application Sep. 29, 1987, Ser. No. 104,590

Claims priority, application Sweden, Jan. 28, 1985, 8500378

Int. Cl.[4] B65G *53/04*

U.S. Cl. 406—141 **12 Claims**



1. Fluid transport apparatus for discharging particulate material with a fluid from a first chamber subjected to a high internal pressure to a second chamber having a significantly lower pressure comprising:

a first conduit for transporting said material from said first chamber, said first conduit having a closed downstream end;

a second conduit positioned within and spaced from the inner surface of said first conduit with an open end at its upstream end which faces the downstream end of the first conduit, said second conduit defining at its inlet end a smoothly decreasing cross-sectional area in its downstream direction and a minimum cross-sectional area which is substantially less than the cross-sectional area of the space between said first and second conduits;

said second chamber receiving the output of said particulate material and said fluid as it emerges from said second conduit and having a cross-sectional area which is at least ten times greater than said minimum cross-sectional area of said second conduit;

whereby the reversal in direction of flow of the particulate material before it enters said second conduit and its subsequent emergence into said second chamber causes a substantial portion of the particulate material, and especially the particles thereof which are of greater mass, to pass through the central part of said second conduit particularly adjacent its upstream end to thereby reduce significantly the wear at the entrance to said second conduit.

4,802,797

MATERIAL APPLICATOR ASSEMBLY AND WIPER THEREFOR

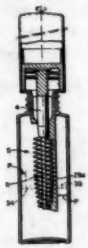
Rodney D. Cole, 24 Pine Walk, Cobham, Surrey, England

Filed May 19, 1986, Ser. No. 865,081

Claims priority, application United Kingdom, May 22, 1985, 8512802; Mar. 5, 1986, 8605342

Int. Cl.[4] A45D *40/26*

U.S. Cl. 401—122 **19 Claims**



1. A material applicator assembly comprising an elongate applicator, a container for the material to be applied by the applicator, a wiper unit having a wiping orifice for squeezing and wiping a material-retaining portion of the applicator upon its withdrawal from the container to limit the amount of material retained thereon, and a cleaning member adapted to project inwardly relative to the orifice and penetrate an inner part of said material-retaining portion to aid the removal of material from said inner part, said cleaning member being flexible radially outwardly to allow the passage of a shank portion of the applicator to be withdrawn through and wiped by the wiping orifice, the shank portion being formed with at least one recess spaced axially from said material-retaining portion for accommodating said cleaning member when the applicator is fully inserted into the container.

4,802,798

DRILL HEAD

Thomas Adamson, 1619 N. Home, Mishawaka, Ind. 46545

Filed Dec. 14, 1987, Ser. No. 132,259

Int. Cl.[4] B23B *45/14*

U.S. Cl. 408—112 **5 Claims**

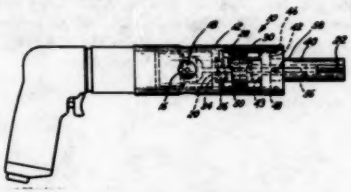
1. A drill head for use with a drill including means for securing said drill head to said drill, said drill head comprising

an elongated cylindrical outer barrel of a diameter sufficient to surround the front portion of said drill,

said outer barrel having a first abutment means intermediate its length,

an inner barrel supported for longitudinal movement within said outer barrel,

said abutment means at the foremost end of said outer barrel,



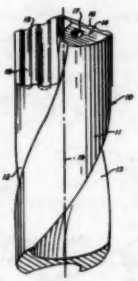
spring means extending between said first abutment means and said inner barrel to urge said inner barrel into engagement with said second abutment means, and a pair of lock rings threadably mounted to the inner wall of said outer barrel and adjustable to form a stop which determines the extent of longitudinal movement of said inner barrel into said outer barrel.

4,802,799

DRILL BIT

Marko I. Rachev, Vernon Hills, Ill., assignor to Marken Tool Company, Mundelein, Ill.

Filed Jan. 10, 1987, Ser. No. 60,153
Int. Cl.[4] B23B 51/02
U.S. Cl. 408—144 10 Claims



1. In a cylindrical drill defining an axis and having a tip at one end thereof and a pair of diametrically opposite, helical flutes opening into said tip, the improvement comprising:

a diametric slot in said drill bisecting said tip; and

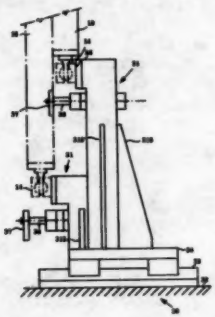
an insert in said slot defining a cutting edge constructed to cause metal chips being cut by said cutting edge to be fragmented, a portion of said insert at said tip having cylindrical grooves each defining a length and a radius, the length of said grooves being substantially greater than the radius thereof, said grooves extending at a preselected acute angle to said drill axis, said cutting edge comprising a wavy edge defined by a pair of oppositely oriented serpentine series of said grooves, said series being symmetrically disposed relative to said drill axis.

4,802,800

PASSIVE POSITIONING APPARATUS

Dino Costin, New Hyde Park, and Howard Citron, Northport, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Oct. 5, 1987, Ser. No. 105,560
Int. Cl.[4] B23C 9/00; B66C 23/00
U.S. Cl. 409—131 9 Claims



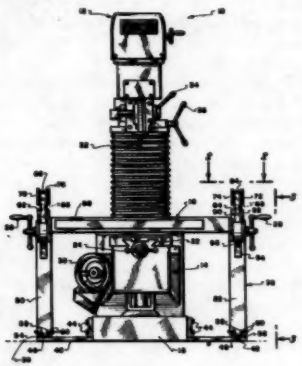
1. A method for enhancing the ability of robots to hold the position of a part in the presence of external forces comprising the steps of: providing at least three non-colinear adaptive clamping surfaces on a robot end effector, said adaptive clamping surfaces being flat, each of said surfaces being substantially parallel to a plane and free to rotate about two axes mutually perpendicular to a normal to said plane; providing a mating flat clmaping surface for each said adaptive clamping surface, said mating surface being free to mvoe in a direction substantially perpendicular to said plane of said adaptive clamping surface; applying a compliant force to maintain said adaptive clmaping and mating surfaces in intimate contact during robot positioning; immobilizing said mating clamping surfaces; and clamping said adaptive clamping surfaces to said mating surfaces, said clamping totally immobilizing said end effector.

4,802,801

WORKTABLE SUPPORT FOR MACHINE TOOL

Wolfram F. O. Fengler, 16721 Chaparral, Cerritos, Calif. 90701

Filed Nov. 6, 1987, Ser. No. 117,575
Int. Cl.[4] B23C 1/14
U.S. Cl. 409—168 4 Claims



1. In combination with a machine tool having a tool supporting column and a horizontal worktable, said tool supporting

column being movable toward and away from said worktable, a floor mounted base, said tool supporting column being mounted on said base, a knee, said worktable being movably mounted on said knee, said worktable having longitudinal spaced apart ends, said ends being cantilevered relative to said knee, said knee being mounted on said base, the improvement comprising:

a support apparatus for said worktable, said support apparatus including a pair of arms, each said arm having an outer end, a said outer end connecting by connection means with a said end of said worktable; and

arm support means composed of a pair of actuating cylinder arrangements, therebeing a said actuating arrangement for each said arm, a said actuating cylinder arrangement connecting with a said arm and being for the purpose of raising and lowering its respective said arm, whereby each said actuating cylinder arrangement is to slightly raise its respective said end of said worktable and orient such precisely in horizontal alignment with the portion of said worktable located directly above said knee.

4,802,802

ATTACHMENT UNIT INCLUDING NAIL AND SLEEVE

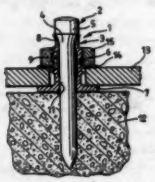
Elmar Thurner, Feldkirch, Austria, assignor to Hilti Aktiengesellschaft, Fürstentum Liechtenstein, Fed. Rep. of Germany

Filed Mar. 7, 1988, Ser. No. 164,823

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707424

Int. Cl.[4] F16B *39/00, 5/02*

U.S. Cl. 411—107 **6 Claims**



1. Attachment unit comprising an axially elongated nail having an axially elongated shank with a head at one end of and extending transversely outwardly from said shank, and an axially extending sleeve guided on said shank so that the nail can be driven by an explosive powder charge through the sleeve into a receiving material, said sleeve comprises a first end more remote from the head of said nail and a second end, an abutment flange located at and extending transversely outwardly from the first end of said sleeve, a first axially extending sleeve section extending from said flange toward the second end of said sleeve, said first sleeve section having an axially extending exterior thread with a root diameter, wherein the improvement comprises a axially extending second sleeve section extending from the first sleeve section to the second end of said sleeve, said second sleeve section has an outside diameter smaller than the root diameter of said exterior thread, said attachment unit having a first condition before being driven into the receiving material and a second condition after it is driven into the receiving material, whereby in the first condition said second sleeve section is spaced from the head of said nail and in the second condition the head of said nail is driven into said second sleeve section and deforms said second sleeve section.

4,802,803

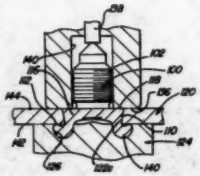
FASTENING ELEMENT AND PANEL ASSEMBLY

Rudolph R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 852,689, Apr. 16, 1986, Pat. No. 4,713,872, which is a continuation-in-part of Ser. No. 773,387, Sep. 6, 1985, Pat. No. 4,633,560, which is a division of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 458,099, Mar. 28, 1983, Pat. No. 4,459,073, and Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, which is a continuation of Ser. No. 229,274, Jan. 28, 1981, abandoned, said Ser. No. 458,099, is a division of Ser. No. 229,274,. This application Aug. 24, 1987, Ser. No. 91,554

Int. Cl.[4] F16B *37/04*

U.S. Cl. 411—183 **6 Claims**



1. A panel assembly, comprising a metal panel and a metal fastening element, said panel including an aperture having a cone-shaped internal surface extending therethrough and said fastening element permanently attached to said panel within said panel aperture, said fastening element including a disk-shaped portion having a conical exterior surface press fitted into said panel aperture and forming said aperture conical internal surface, said fastening element exterior conical surface conforming to and mating with said panel aperture conical internal surface throughout its length having major and minor diameters, said mating cone-shaped surfaces interlocking and limiting movement of said element in one direction, said fastening element having an intergral annular rim extending from adjacent said minor diameter of said disk-shaped portion, said rim being hook-shaped in cross-section and having an annular free end portion resiliently biased against said panel spaced radially outwardly from said panel aperture preventing pull-out of said element from said panel aperture in the opposite direction from said first direction, and said fastening element including a body portion extending from said disk-shaped portion opposite said rim.

4,802,804

PLASTIC CLIP WITH RESILIENT THREAD SEGMENTS AND HINGED CLASP

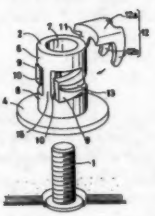
Toshio Hirohata, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed May 3, 1988, Ser. No. 189,783

Claims priority, application Japan, May 11, 1987, 62-112583

Int. Cl.[4] F16B *37/08*

U.S. Cl. 411—433 **2 Claims**



1. A plastic clip to be tightened against a bolt, comprising a

base having a through hole to be penetrated vertically by said bolt, an upright post extending upright from the top of said base adjacent to said through hole, a cylindrical portion united to the outer end of said upright post and having a hole formed above and coaxial with said through hole in said base for receiving said bolt, a pair of flexible arms one extending in a curved fashion from each side of said upright post between said base and said cylindrical portion to slightly project with respect to the outer shape of said cylindrical portion and having a curved concave inner surface provided with a thread to be meshed with the male thread of said bolt, and a bifurcated pivotable member vertically rockably united via a reduced thickness hinge portion to the outer periphery of said cylindrical member, said bifurcated pivotable member serving to urge said pair of flexible arms sidewise against said bolt when rocked downwards.

4,802,805

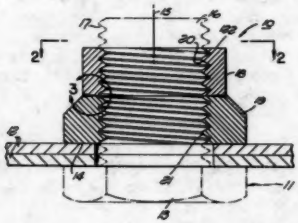
FATIGUE RESISTANT FASTENERS AND RELATED METHODS

Mark Haytan, Orange, Calif., assignor to William P. Green, Pasadena, Calif., a part interest

Continuation of Ser. No. 742,290, Jun. 7, 1985, abandoned, which is a division of Ser. No. 380,439, May 20, 1982, Pat. No. 4,545,104, which is a continuation-in-part of Ser. No. 111,774, Jan. 14, 1980. This application Apr. 23, 1987, Ser. No. 41,638

Int. Cl.[4] F16B *39/28, 39/30*

U.S. Cl. 411—263 **5 Claims**



1. A fatigue resistant threaded connection including a screw, a nut and a work piece or work pieces, and which is formed by the method that comprises:

connecting together a screw having an external thread and a nut having first and second portions near outer and inner ends respectively of the nut attached rigidly together at a location intermediate said ends and carrying two aligned internal threads respectively of a common pitch engaging said external thread at different locations; with said two internal threads, before engagement with the screw, being retained in fixed relative positions in which one internal thread is not a true helical continuation of the other, and in which portions of the two internal threads lying in a common axial plane are spread slightly farther apart axially than if the internal threads were true helical continuations of one another;

initially applying force to said external thread of the screw by each of said two internal threads of the nut in a direction axially away from the other internal thread of the nut by virtue of said slightly spread condition of the internal threads;

then tightening said screw and nut threadedly relative to one another against the resistance of a work piece or work pieces to a preloaded condition stretching said screw axially relative to said nut; and

in said preloaded condition applying force to said external thread of the screw by said two internal threads of the nut in a common axially outer direction rather than opposite directions axially away from one another;

the radial thickness of said nut, between the major diameter of said internal threads and a radially outer surface of the nut, being substantially as great at said intermediate location as at said first portion of the nut to transmit high preload forces from said first portion through said intermediate location to said second portion of the nut, for transmission by said second portion to said work piece or work pieces, without excessive deformation of the nut at said intermediate location.

4,802,806

TENSION DEVICE FOR TIGHTENING AND LOOSENING BOLTS OR PINS

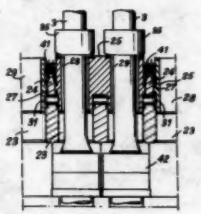
Gerard Sevelinge, Montceau-les-Mines, France, assignor to Framatome, Courbevoie, France

Filed Nov. 4, 1986, Ser. No. 926,499

Claims priority, application France, Nov. 4, 1985, 85 16293

Int. Cl.[4] F16B *35/02, 37/08*

U.S. Cl. 411—383 **8 Claims**



1. Tension device for simultaneous tightening and loosening of a plurality of fastening member (3), said device comprising a body having at least one jack (40, 51) equipped with a piston (25, 53), each said at least one jack (40-51) being associated with at least two fastening members (3) positioned adjacent to one another for simultaneous extension thereof.

4,802,807

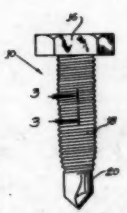
THREADED FASTENER

Mark Offenburger, Elgin; Eric Parker, Algonquin, and Frank Ptak, Highland Park, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 14, 1988, Ser. No. 181,749

Int. Cl.[4] F16B *25/00*

U.S. Cl. 411—387 **9 Claims**



1. A threaded fastener having improved driving performance for corrosion-resistant securement of one or more metallic work pieces, said fastener comprising: a drive head; and a composite threaded shank comprising a threaded inner core; a zinc plating applied to said core; and an aluminum plating applied on said zinc plating, to promote lubricity in driving said shank into said work pieces.

4,802,808

STACKING APPARATUS FOR DEEP-DRAWN ARTICLES OF PLASTICS OF PLASTICS MATERIAL

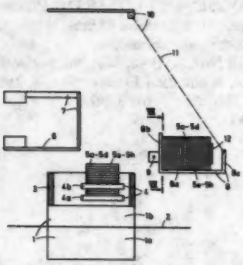
Frank-Michael Wölk, and Horst Zabel, both of Lübeck, Fed. Rep. of Germany, assignors to Maschinenbau Gabler GmbH, Lübeck, Fed. Rep. of Germany

Filed Jul. 28, 1987, Ser. No. 78,919

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625841

Int. Cl.[4] B65G *57/28, 57/30*

U.S. Cl. 414—789.2 7 Claims



1. A stacking apparatus for deep-drawn articles made from plastics material in a thermoforming machine, comprising a lower stacking plate and an upper stacking plate adapted for receiving formed articles from a forming die of the thermoforming machine, the lower and upper stacking plates capable of forming vertically extending stacks of articles, the upper stacking plate vertically raisable from a position above the forming die to a raised position, a first pushing dvice for pushing stacks of articles carried by the upper stacking plate into the raised position thereof, a support plate exclusively horizontally movable from a first position into a second position in which the support plate is moved underneath the first pushing device and underneath the stacks of articles carried by the upper stacking plate into the raised position thereof, the support plate capable of carrying the stacks of articles after the upper stacking plate has been lowered, a tilting frame tiltable about a horizontal axis from a vertical position next adjacent the support plate to an essentially horizontal position, the first pushing device being movable horizontally parallel to the support plate, the first pushing device serving for pushing the stacks of articles from the support plate onto the tilting frame when the tilting frame is in the vetical position and a second pushing device capable of sliding into the tilting frame when the tilting frame is in the horizontal position.

4,802,809

MANIPULATOR FOR STANDARD MECHANICAL INTERFACE APPARATUS

Anthony C. Bonora, Menlo Park, and Andrew W. O'Sullivan, Gilroy, both of Calif., assignors to Asyst Technologies, Milpitas, Calif.

PCT No. PCT/US86/01758, § 371 Date Apr. 20, 1987, § 102(e) Date Apr. 20, 1987, PCT Pub. No. WO87/01361, PCT Pub. Date Mar. 12, 1987

Continuation-in-part of Ser. No. 769,709, Aug. 26, 1985, Pat. No. 4,676,709, which is a continuation-in-part of Ser. No. 769,850, Aug. 26, 1985, Pat. No. 4,674,936. This PCT application Aug. 25, 1986, Ser. No. 49,393

Int. Cl.[4] B65G *65/00*

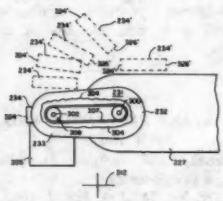
U.S. Cl. 414—217 37 Claims

1. Apparatus for transferring a cassette holding articles to be processed to and from a container supported at a processing station where the processing station has a cassette port for receiving the cassette when the cassette moves along a central axis extending from outside the processing station through the cassette port, and into the processing station, said apparatus comprising:

platform means including a cassette platform transportable substantially along said central axis for transferring the cassette to and from the container substantially along said central axis;

manipulator means including a first member extending substantially orthogonal to said central axis, the first member including a first portion and a second portion;

a pivoting arm including a pivoting portion and a coupling



portion, the pivoting portion mounted pivotally adjacent to the second portion of the first member, the pivoting arm operable to pivot about a pivot axis extending substantially through the pivoting portion and substantially perpendicular to the central axis;

coupling means mounted adjacent to the coupling portion of the pivoting arm for coupling to the cassette; and

tilt means for tilting the coupling means and the cassette coupled thereto during pivoting by said pivoting arm, such that during the pivoting the cassette tilts relative to the central axis.

4,802,810

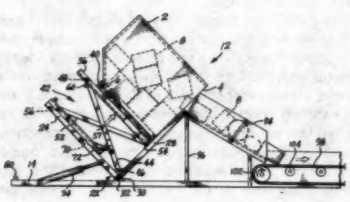
APPARATUS FOR UNLOADING CONTAINERS

Erwin T. Gunn, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 24, 1987, Ser. No. 100,735

Int. Cl.[4] B65G *65/23*

U.S. Cl. 414—414 19 Claims



1. Apparatus for unloading articles from a container having a side opening, comprising;

a frame including a base and a restraining wall substantially perpendicular to the base; said wall being dimensioned to cover said opening;

a table mounted on and essentially parallel to the base and dimensioned to receive said container thereon with said opening adjacent to said wall;

pivot means for pivoting the frame and the table, with said container positioned thereon, from an initial position in which the base is substantially horizontal to an inclined position in which said opening faces generally downwardly;

raising means disposed between the base and the table for raising the table and said container relative to the frame, following pivoting of the frame and the table to said in-

clined position, to progressively uncover said opening and allow gravity to cause articles in the container to move out through said opening; and

conveyor means positioned to receive said articles.

4,802,811

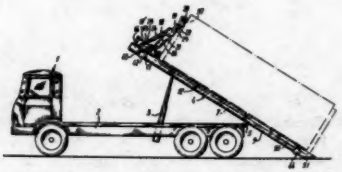
APPARATUS FOR LOADING AND UNLOADING AN INTERCHANGEABLE CONTAINER ONTO AND FROM A VEHICLE

Derk Nijenhuis, Hoogeveen, Netherlands, assignor to N.C.H. Hydraulische Systemen BV, Hoogeveen, Netherlands

Continuation of Ser. No. 723,964, filed as PCT NL84/00026 on Aug. 13, 1984, published as WO85/00787 on Feb. 28, 1985, abandoned. This application Jan. 16, 1987, Ser. No. 4,058

Int. Cl.[4] B60P *1/64*; B65G *63/02, 67/02*

U.S. Cl. 414—478 **5 Claims**



1. A self-loading and unloading apparatus for a vehicle having a tiltable frame mounted on said vehicle, gripping means movably positioned on said frame for engaging an interchangeable container and lifting said container from a lower level onto said vehicle by vertical and horizontal movements such that a first lower terminal edge of the container is moved onto said vehicle and that thereupon the container is moved longitudinally onto said vehicle until said container is fully supported by said vehicle and for unloading said container from said vehicle by reversing the aforesaid movements, the improvement comprising:

a slidable track means disposed and guided in a longitudinal direction in said tiltable frame,

said tiltable frame being mounted for pivotal movement on said vehicle about a horizontal axis near a pick-up location for said containers,

a movable carriage mounted for longitudinal movement on said slidable track means,

a drive mounted on said frame,

flexible pulling means coupled to said drive and said carriage for moving said carriage,

hooking means connected to said flexible pulling means for engaging containers to be loaded and unloaded from said vehicle,

a plurality of different container gripping means including said hooking means and at least one gripping means mounted on said carriage,

each of said plurality of gripping means engaging a different type of container thereby allowing the use of said self-loading apparatus on a variety of different types of containers.

4,802,812

APPARATUS FOR HARVESTING ROW CROPS

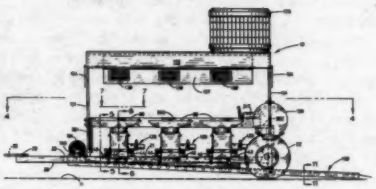
Leland S. Simpson, III, 4275 N. Chateau Fresno, Fresno, Calif. 93711

Filed Jul. 12, 1985, Ser. No. 754,179

Int. Cl.[4] B60P *1/00*

U.S. Cl. 414—508 **11 Claims**

1. An apparatus for harvesting row crops comprising a frame adapted for earth traversing movement along a first path substantially parallel to and laterally disposed with respect to a row crop, a harvesting unit borne by the frame for movement along a second path substantially transversely related with respect to the first path toward and from the row crop and adapted to receive a field worker thereon in a seated position facing the row crop for movement with the harvesting unit toward the row crop along the second path by the field worker manually moving the harvesting unit along said second path, means mounted on the harvesting unit for receiving the crop harvested from the row crop by the field worker and transporting said crop for collection, and resilient means connected to the harvesting unit for urging the harvesting unit along the



second path from the row crop whereby said manual moving of the harvesting unit along said second path by the field worker is required only for movement along the second path toward the row crop and said resilient means returns said harvesting unit to a retracted position in movement from said row crop along the second path upon said field worker terminating manual resistance thereto.

4,802,813

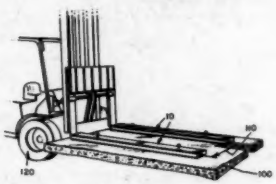
APPARATUS TO BE USED IN CONJUNCTION WITH A FORKLIFT FOR LIFTING AND MOVING A CONCRETE SLAB

Charles C. Perry, 8513 Newcastle Ave., Northridge, Calif. 91325

Filed Mar. 14, 1988, Ser. No. 167,709

Int. Cl.[4] B66F *9/12*

U.S. Cl. 414—607 **10 Claims**



6. An apparatus to be used in conjunction with a forklift for lifting and moving a concrete slab, comprising:

a. an elongated housing member defined by a top section, a pair of sidewalls attached at either end of said top section, and a pair of outwardly protruding floor members with one floor member attached to the end of a respective sidewall remote from said top section and which extend generally parallel to said top section and away from the top section and away from the sidewall to which it is attached;

b. an interior channel defined by said top section and said pair of sidewalls;

c. a multiplicity of spaced apart openings in each of said pair of floor members;

d. a multiplicity of anchor bolts inserted through said spaced apart opening such that one anchor bolt is inserted through a selected one of the spaced apart openings;

e. a first rotatable cover member enclosing a sidewall and its adjacent floor member;

f. said first rotatable cover member being rotatable to permit access to the openings in its adjacent floor member, and define an opened position;

g. a second rotatable cover member enclosing the other sidewall and its adjacent floor member;

h. said second rotatable cover member being rotatable to permit access to the openings in its adjacent floor member, and define an opened position;

i. a first securing means to maintain said first cover in a closed position enclosing a sidewall, its adjacent floor member and a multiplicity of anchor bolts; and

j. a second securing means to maintain said second cover in a closed position enclosing a sidewall, its adjacent floor member and a multiplicity of anchor bolts;

k. whereby said apparatus is attached to said concrete slab through said multiplicity of anchor bolts extending through the openings in the floor members and affixed into the concrete slab while said first and second covers are in the opened position and thereafter the first and second covers are rotated into the closed position and fastened closed and said concrete slab is raised and moved by inserting a fork of a forklift through said interior channel and causing the fork to move upwardly on the forklift.

4,802,814

DEVICE FOR ATTACHING FRONT LOADER TO TRACTOR

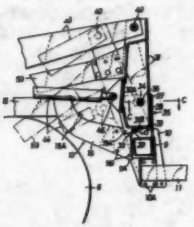
Isao Kourogi; Keiichi Masuda; Masami Hirooka; Yoshio Tomiyama; Kazunori Yoshiuchi, and Takashi Gokenya, all of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Mar. 31, 1987, Ser. No. 32,384

Claims priority, application Japan, Apr. 23, 1986, 61-93923; Apr. 23, 1986, 61-93924; Nov. 28, 1986, 61-285028

Int. Cl.[4] B66C *23/36*

U.S. Cl. 414—686 **7 Claims**



7. A device for attaching to a tractor body a front loader having a pair of opposite booms carrying working means at their front ends, a pair of opposite masts pivotably supporting the pair of booms respectively, and a pair of opposite braces projecting forward from the pair of masts respectively, by removably mounting each of the masts on a mast support fixed to the tractor body and removably fixing the front end of each of the braces to a brace fixing member secured to a front portion of the tractor body;

the device being characterized in that each of the opposite mast supports comprises a fitting portion, said fitting portion having a back wall and opposite side walls to form an open concave shape in plan view to receive the mast which will enter from a forward and higher position for removable insertion;

that a projection is provided to connect said opposite side walls at a point intermediate in height of each of the mast supports to serve as a pivot in an attaching or in a removing action;

that each of the masts is secured removably in a respective mast-fitting portion, each of the masts having a hollow box shape and its transverse dimension being sized to allow the mast to engage into the mast support, opposed skirts are formed on a lower end of each said mast, a recess is formed in each said skirt to receive said projection, an inclined slant guide face is formed on both sides of each recess to guide said projection into the recess, thus pivotal support means is formed by engagement of the projection with the recess;

that means is provided for removably attaching the mast to the mast support while the mast is supported by said projection comprising lockpin holes, oppositely opened on the opposite side walls of said mast support located above said projection and pins which are removably insertable transversely from the outside of the mast support and wherein each hole is formed to allow a longitudinal movement of the pin relative to the hole therein to buffer impacts which remain after the buffering action of the braces, and each hole extends longitudinally and is closed to control displacements of the engaged pin;

whereby breaking of the pins is avoided when elastic deformation of the braces take place due to external impacts.

4,802,815

INDUSTRIAL ROBOT

Takanori Funabashi, Hirakata; Akiyoshi Nakada, Suita, and Haruo Tada, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

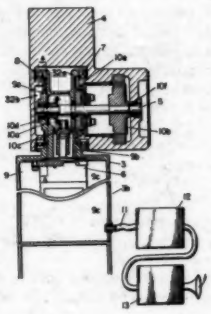
PCT No. PCT/JP84/00586, § 371 Date Aug. 6, 1985, § 102(e) Date Aug. 6, 1985, PCT Pub. No. WO85/02577, PCT Pub. Date Jun. 20, 1985

PCT Filed Dec. 12, 1984, Ser. No. 767,268

Claims priority, application Japan, Dec. 15, 1983, 58-236618

Int. Cl.[4] B25J *17/00*

U.S. Cl. 414—680 **11 Claims**



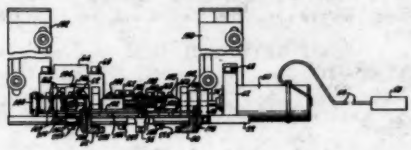
1. In an industrial robot including a stationary arm and a driven arm for constituting articulations, bearing means for rotatably supporting said driven arm relative to said stationary arm, and a driven source provided in said stationary arm for swiveling said driven arm relative to said stationary arm, the tip end of said driven arm being adapted to be positioned at any position in a space, the improvement comprising an internal air chamber formed by substantially closing a space surrounded by said stationary arm, said driven arm and said bearing means in a manner to separate the same from the outside air; and air passage provided in a wall of said stationary arm, said air passage being in communication with an area of said internal air chamber near an inner peripheral side of said bearing means and connecting said internal air chamber to a cavity provided within aid stationary arm; negative pressure generating means for sucking air contained in said cavity, said air passage and said internal air chamber to make the air pressure therein lower than the pressure of the outside air; and piping means for connecting said negative pressure generating means to said cavity.

4,802,816

PICK AND PLACE MACHINE HAVING IMPROVED CENTERING JAWS

Victor B. Mezhinsky, Anaheim, Calif., assignor to Excellon Industries, Terrance, Calif.

Filed Oct. 8, 1985, Ser. No. 785,601
Int. Cl.[4] B65G 47/91; H05K 13/02
U.S. Cl. 414—736 16 Claims



13. A pick and place machine for positioning a part having a plurality of side faces, comprising:

a vacuum head that lifts and suspends said part; and

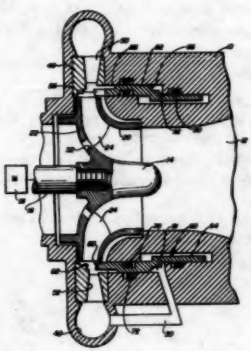
first and second pairs of opposing centering jaws positioned substantially perpendicular to said vacuum head to contact only the side faces of said part, and movable linearly in a plane perpendicular to said vacuum head to adjust the position of said part on said vacuum head.

4,802,817

CENTRIFUGAL PUMP WITH SELF-REGULATING IMPELLER DISCHARGE SHUTTER

Thomas R. Tyler, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1987, Ser. No. 137,163
Int. Cl.[4] F01D 17/08
U.S. Cl. 415—157 7 Claims



1. A centrifugal pump comprising:

a housing,

an impeller rotatable in said housing;

an outlet volute extending about said impeller;

an impeller discharge shutter movably mounted in said housing in surrounding radially-spaced relation with said impeller with a forward section variably positionable in a flow path between the impeller and the volute and having an end exposed to tip static pressure at the tip of the impeller; and

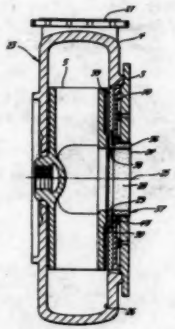
means communicating a remote opposite end portion of the impeller discharge shutter with volute pressure whereby the impeller discharge shutter forward section, at certain flow rates, is variably positionable in said flow path dependent upon the values of said tip static pressure and said volute pressure, said end of the impeller discharge shutter and said remote end portion thereof being of constant area constantly exposed to said tip static pressure and volute pressure respectively, in all the variable positions of the impeller discharge shutter whereby said variable positions are determined solely by the relative values of tip static pressure and volute pressure applied to the constant areas of the impeller discharge shutter.

4,802,818

SLURRY PUMP SUCTION SIDE LINER WITH REPLACEABLE COMPONENTS

Daniel Wiggins, 700 Homestead, and Robert B. Flood, Jr., 13 Oakhill Dr., both of Marquette, Mich. 49855

Filed Sep. 28, 1987, Ser. No. 101,390
Int. Cl.[4] F04D 29/42
U.S. Cl. 415—170 A 10 Claims



1. A slurry pump action side liner for use in a pump having a casing and an impeller defined by an axis in said casing, comprising, in combination, a suction port through which a slurry enters said impeller substantially parallel to said axis; an annular wear ring assembly proximate said impeller positioned between said impeller and said suction port so as to be a certain predetermined distance from said impeller, said predetermined distance being so small as to substantially prevent said slurry passing between said wear ring assembly and said impeller; an annular wear plate assembly positioned so as to substantially surround said wear ring assembly and positioned substantially at said predetermined distance from said impeller; and connection means for rigidly and removably connecting said wear plate assembly, said wear ring assembly and said suction port to said casing whereby a slurry which enters said suction port passes through said wear ring assembly and said wear plate assembly into said impeller and said suction port, and said wear ring assembly and said wear plate assembly may be selectively removed and replaced.

4,802,819

CENTRIFUGAL PUMP

Jack T. Bevington, and Alan B. Channell, both of Ashland, Ohio, assignors to McNeil (Ohio) Corporation, St. Paul, Minn.

Filed Sep. 14, 1987, Ser. No. 95,665
Int. Cl.[4] F04D 17/12
U.S. Cl. 415—199.3 7 Claims

6. A stage for a centrifugal pump having a plurality of axially aligned stages comprising:

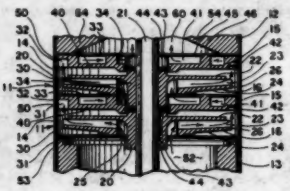
housing means having a cylindrical wall defining a portion of the outer surface of the pump and a annular end wall having a centrally located aperture;

diffuser means fully received within said housing means and affixed to said end wall of said housing means and having a discharge opening adjacent said aperture;

impeller means rotatably received within said housing means

in operative association with said diffuser means, said impeller means having an inlet opening; and

means to axially align said housing means with a housing



means of an axially adjacent stage including a rim circumferentially about one axial end of said housing means and a pilot region circumferentially about the axially distal end of said housing means.

4,802,820

COMPACT TURBINE HOUSING

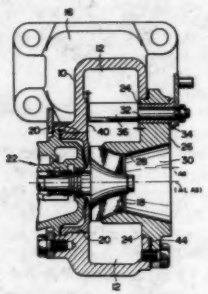
Hiroshi Komatsu, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Aug. 9, 1985, Ser. No. 764,067

Claims priority, application Japan, Aug. 15, 1984, 59-169234

Int. Cl.[4] F04D *29/60*

U.S. Cl. 415—201 **7 Claims**



1. A turbine arrangement for use in an automotive turbocharger or the like, comprising:

a housing;

a turbine impeller disposed in said housing, said impeller having a first axis about which it is rotatable;

means defining a first aperture in said housing, said first aperture having a second axis, said second axis being offset from said first axis, said first aperture casting a shadow into said housing;

a cover detachably secured to said housing in a manner which closes said first aperture;

means defining an exhaust port in said cover, said exhaust port having an axis coincident with said first axis;

means defining a scroll passage in the housing, said scroll passage being arranged to direct gases from an inlet port toward said impeller;

a variable nozzle located at the downstream end of said scroll passage for variably throttling the flow of gases flowing though said scroll passage from an inlet port toward said impeller, said variable nozzle including a pivotally mounted vane, said vane being pivotal between first and second extreme positions;

means defining a precision machined surface in said housing, said precision machined surface being arranged immediately adjacent an edge of said vane and in an area over which said vane sweeps as it pivots from said first extreme position to said second extreme position, said precision machined surface being located so that at least the portion thereof which is closest to said impeller lies in the shadow of said first aperture.

4,802,821

AXIAL FLOW TURBINE

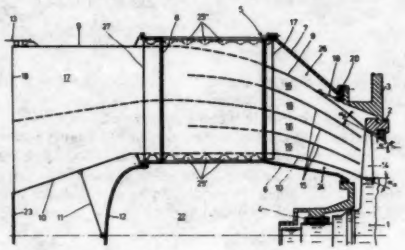
Franz Krietmeier, Baden, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Sep. 21, 1987, Ser. No. 99,020

Claims priority, application Switzerland, Sep. 26, 1986, 3876/86

Int. Cl.[4] G01D *25/30*

U.S. Cl. 415—210 **13 Claims**



1. Axial flow turbine comprising reaction blading having outlet rotor blades (14) with a high Mach number flow and a large opening angle and which are followed by a diffuser with axial outlet into an exhaust gas pipe (13), wherein kink angles (α_N, α_Z) of an inlet of the diffuser both at an inner boundary wall of the diffuser and at an outer boundary wall of the diffusor are fixed so as to even out the energy profile over the height at an outlet portion from a last rotor blade row and wherein means for removing swirl from the swirling flow are provided within a diffuser zone.

4,802,822

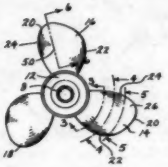
MARINE PROPELLER WITH OPTIMIZED PERFORMANCE BLADE CONTOUR

Hubert S. Gilgenbach, Butte des Morts, and Ronald M. Steiner, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 8, 1987, Ser. No. 106,140

Int. Cl.[4] B63H *1/26*

U.S. Cl. 416—235 **5 Claims**



1. A marine propeller comprising a hub having a plurality of blades extending generally radially outwardly therefrom to respective outer tips, each blade having a leading edge and a trailing edge, each blade having a pressure surface defined between said hub and said outer tip and between said leading edge and said trailing edge, said pressure surface having a progressive pitch from said leading edge to said trailing edge along a given radius from said hub, and means providing uniform loading of said pressure surface from said hub to said tip and preventing overloading of said tip, comprising a contoured

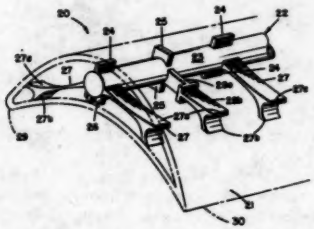
said pressure surface having increasing progressiveness of said pitch with increasing radii from said hub to said tip.

4,802,823

STRESS RELIEF SUPPORT STRUCTURES AND ASSEMBLIES

Gary W. Decko, Wethersfield; Yao Peng, Woodbridge, and Herman Vogel, Newtown, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed May 9, 1988, Ser. No. 191,324
Int. Cl.[4] F01D 5/18
U.S. Cl. 416—97 A 12 Claims



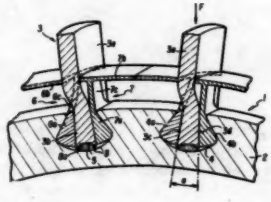
1. A flexible interior support structure, for absorbing the internal stresses normally developed during the gradient heating of an outer surface layer comprising a thin, elongate, contoured, heat-expandable and/or distortable metal sheathing, said support structure being unitary, and comprising an elongate metallic support core designed to extend along at least a major portion of the length of the elongate contoured element which it is designed to support, and a plurality of spaced flexible metallic eextension arms attached to said core and extending therefrom in different directions for supporting engagement between the ends thereof and a thin contoured outer surface layer to be supported by said support structure in spaced relation to the said elongate metallic support core, said extension arms being flexible and/or twistable relative to said support core to permit heat expansion and/or distortion of the outer surface layer relative to the support core while absorbing the internal stresses normally generated by such expansion and/or distortion.

4,802,824

TURBINE ROTOR

Philippe M. D. Gastebois, Vert Saint Denis, and Jean-Francois R. Imbault, Ponthierry, both of France, assignors to Societe Nationale d'Etude et Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Dec. 11, 1987, Ser. No. 131,725
Claims priority, application France, Dec. 17, 1986, 86 17634
Int. Cl.[4] F01D 5/32
U.S. Cl. 416—193 A 5 Claims



1. A turbine rotor comprising

a disc,

a plurality of rectilinear, axially oriented sockets in the periphery of said disc, said sockets being evenly distributed around said periphery and each having side walls and a bottom wall providing said socket with a dovetail shaped cross-section,

a plurality of blades disposed in respective ones of said sockets and projecting radially outwards from said periphery of said disc, said blades being formed of a composite ceramic fibre material and each of said blades having

an aerofoil shaped body radially outwards of said disc defining concavely and convexly curved sides of said blade, and

a root received in one of said sockets, said root being in the form of a bulb and having a bottom face and two flat side faces defining an angle of convergence towards said body not exceeding 10 o whereby said ceramic fibres of said blade proceed continuously from said body to said root of said blade without geometric distortion, and

locking means associated with each of said blades for locking said blade in said corresponding socket, said locking means including a pair of elements disposed on opposite sides of said blade, each of said elements comprising

a wedge-shaped member disposed in said socket between one of said side faces of said root and the adjacent one of said side walls of said socket to ensure radial locking of said blade,

a platform disposed adjacent said blade radially outwards of said disc and extending in a circumferential direction, and

a strut connecting said platform to said wedge-shaped member,

said platforms of said elements of said locking means of all of said blades co-operating to form a continuous ring intersected by said blades and defining part of the inner boundary of the main streamline flow path of the turbine gases.

4,802,825

METHOD AND APPARATUS FOR MAINTAINING A MIXTURE OF PRODUCTS AT A CERTAIN TEMPERATURE

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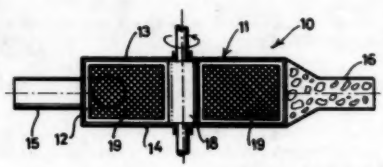
Filed May 13, 1987, Ser. No. 49,617
Claims priority, application Netherlands, May 14, 1986, 8601221
Int. Cl.[4] F04D 29/38
U.S. Cl. 416—231 B 2 Claims



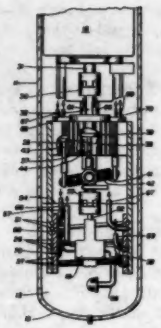
1. A method of maintaining at a certain temperature, and for a certain period of time, a flow of a mixture of products consisting of a liquid of low to medium viscosity incorporating solid particles, wherein the residence time in the vessel of the solid particles mixed with the liquid is separately controlled, such that a desired temperature of the solids can be reached independent of the flow of the liquid.

4,802,826

SEALED, SELF-CONTAINED, LIQUID-COOLED, GAS COMPRESSOR

John M. Hall, Burlingame, Calif., assignor to Rix Industries, Emeryville, Calif.

Filed Jun. 25, 1982, Ser. No. 392,029
Int. Cl.[4] F04B *39/06, 35/04*
U.S. Cl. 417—243 **2 Claims**



1. A sealed, self-contained, liquid-cooled compressor for natural gas comprising:

an enclosed housing providing an elongated, sealed, explosion-proof chamber adapted for vertical positioning of its longitudinal axis in use and providing an oil sump at its normally lower end;

verically superimposed and motive power connected electric motor, multi-stage gas compressor comprising a plurality of stages for successively increasing pressure of gas compressed therein and an oil pump positioned within said housing with said pump lowermost and having an intake connected to withdraw oil from said sump;

a plurality of sets of compressed gas heat exchanger tubes, one set for each stage of said compressor, mounted in said housing within said sump to cool the gas in said tubes; said sets individually connecting the output of each lower stage to the input of the next succeeding stage and the output of the last stage for delivery of compressed gas to a storage tank;

oil heat exchanger tubes connected to the discharge of said pump and mounted externally of said housing for cooling oil therein and being connected to discharge cooled oil onto said motor and compressor for gravitation thereover and into said sump;

a gas inlet conduit connected to the input of the first stage of said compressor; and

means mounted interiorly of said chamber and connected to said inlet conduit allowing any inadvertent escaped high pressure gas in said chamber to be drawn back into said compressor, thus avoiding excessive build-up of gas pressure in said chamber.

4,802,827

COMPRESSOR

Takayoshi Fujiwara, Kawasaki; Toshikatsu Iida, and Tetuo Fukuda, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1987, Ser. No. 137,680
Claims priority, application Japan, Dec. 24, 1986, 61-309408; Dec. 25, 1986, 61-307965; Dec. 26, 1986, 61-315366
Int. Cl.[4] F04B *39/10*; F04C *15/02*
U.S. Cl. 417—356 **11 Claims**

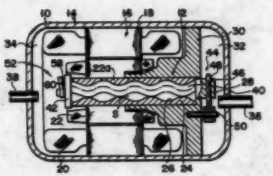
1. A compressor comprising:

a closed casing having a suction chamber and a discharge chamber;

a rotating member rotatably arranged in the casing and having a spiral bore formed along the axis of rotation thereof, said bore having first and second end openings communicating with the suction chamber and the discharge chamber, respectively;

an electric motor section arranged in the casing, for rotating the rotating member;

a spiral internal member inserted in the bore of the rotating member so as to rotate relative to the rotating member while the rotating member rotates, said internal member,



in conjunction with an inner surface of the bore, defining a plurality of closed spaces moving from the first end opening to the second end opening, whereby a fluid in the suction chamber is transported from the first end opening to the second end opening while being confined within the spaces, and is then discharged into the discharge chamber; and

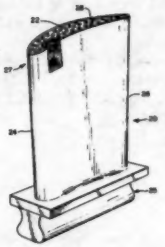
valve means for controlling the discharge of the fluid from the second end opening into the discharge chamber.

4,802,828

TURBINE BLADE HAVING A FUSED METAL-CERAMIC TIP

David A. Rutz, Glastonbury; Edward Lee, Higganum; Robert P. Schaefer, East Hartford, and Edward L. Johnson, Middletown, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 29, 1986, Ser. No. 947,066
Int. Cl.[4] B63H *1/26*; B64C *11/16, 27/46*; F03B *3/12*
U.S. Cl. 416—241 B **9 Claims**



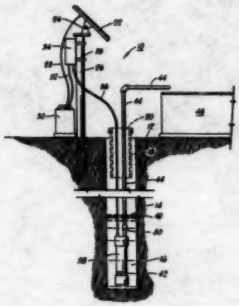
1. A gas turbine engine blade made of a superalloy, comprised of a substrate having an abrasive tip made of ceramic particulate in a predominately fused metal matrix characterized by the blade having a superalloy sheath containing no ceramic particulates along a portion of the periphery of the abrasive tip part, the sheath being attached to the substrate of the blade.

4,802,829

SOLAR CONTROLLED WATER WELL

Michael A. Miller, Rte. 2, Box 55, Selman, Okla. 73834

Filed Feb. 17, 1987, Ser. No. 15,363
Int. Cl.[4] F04B *49/02, 17/00*; F04F *1/20*
U.S. Cl. 417—12 **8 Claims**



1. Apparatus for automatic control of water flowing from a water well to storage, comprising:

a solar panel having a plurality of soluar cells directed to intercept sun rays to generate a d-c voltage output;

a d-c storage cell receiving input of said d-c voltage output;

pump compressor means periodically energized by said d-c storage cell to provide output of air at increased pressure;

an elongated airjet chamber having upper and lower ends and being disposed below the water level of said well and having a nipple in the upper end for receiving the output of air at increased pressure sealingly connected at an upper extremity, said chamber having inlet holes at a bottom extremity to allow entry of water;

an exit tube extending along the majority of the length of said airjet chamber, said exit tube having at least one air mix hole formed through the upper extremities proximate said airjet chamber upper end;

a surface storage tank; and

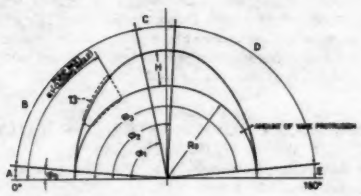
a delivery pipe connected between the exit tube at the upper end of the airjet chamber and the surface storage tank to conduct water in response to said air at increased pressure.

4,802,830

VANE COMPRESSOR WITHOUT OCCURRENCE OF VANE CHATTERING

Nobuyuki Nakajima, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 139,646
Claims priority, application Japan, Jan. 9, 1987, 62-002883
Int. Cl.[4] F04C *18/344*
U.S. Cl. 418—150 **4 Claims**



1. A vane compressor comprising:

a pump housing including a cam ring having an inner peripheral camming surface and opposite axial open ends, and a pair of side blocks secured to said cam ring to close respectively the opposite axial open ends thereof;

a rotor rotatably arranged within said pump housing, said rotor having an outer peripheral surface having a plurality of axial slits formed therein;

a plurality of vanes slidably fitted respectively in said axial slits;

wherein a plurality of pumping chambers are defined by said side blocks, said cam ring, said rotor and said vanes and vary in volume to compress fluid with rotation of said rotor; and

said inner peripheral camming surface of said cam ring having a cam profile comprising:

a first regularly circular portion at which the outer peripheral surface of said rotor is in close contact with said inner peripheral camming surface of said cam ring;

an increasing radius portion continuous to said first regularly circular portion, each of said vanes having an amount of protrusion progressively increasing along said increasing radius portion;

a constant radius portion continuous to said increasing radius portion, said amount of vane protrusion being maintained constant along said constant radius portion;

a decreasing radius portion continuous to said constant radius portion, said amount of vane protrusion decreasing progressively along said decreasing radius portion;

a second regularly circular portion continuous to said decreasing radius portion, the outer peripheral surface of said rotor being in close contact with said inner peripheral camming surface of said cam ring at said second regularly circular portion;

said portions being arranged in the order mentioned above;

said portions of said inner peripheral camming surfaces having respective cam profiles determined respectively by the following equalities and inequalities:

(1) said first regularly circular portion:

$$R(\theta)=R_o \text{ and}$$

$$0° \leqq \theta \leqq \phi_0$$

(2) said increasing radius portion;

$$R(\theta) = R_0 + H \cdot \sin^{5/2}\left[\frac{90}{\phi 1 - \phi 2}(\theta - \phi_0)\right], \text{ and}$$

$$\phi_0 < \theta \leqq \phi_1$$

(3) said constant radius portion:

$$R(\theta)=R_o+H, \text{ and}$$

$$\phi_1<\theta\leqq\phi_2$$

(4) said decreasing radius portion:

$$R(\theta) = R_0 + H - H \cdot \sin^{5/2}\left[\frac{90}{\phi 3 - \phi 2}(\theta - \phi_2)\right], \text{ and}$$

$$\phi_2 < \theta \leqq \phi_3$$

(5) said second regularly circular portion:

$$R(\theta)=R_o \text{ and}$$

$$\phi_3<\theta\leqq 180°,$$

where

R_o is a radius of said rotor;

H is a maximum amount of vane protrusion;

$R(\theta)$ is the amount of vane protrusion +the radius of said rotor;

$\theta$is a rotational angle of said rotor;

ϕ_0 is an angle from a reference point (0°) of rotation of

said rotor to a termination edge of said first regularly circular portion in a rotational direction of said rotor;

ϕ_1 is an angle from said reference position (0°) to a terminating edge of said increasing radius portion in the rotational direction of said rotor;

ϕ_2 is an angle from said reference position (0°) to a terminating edge of said constant radius portion in the rotational direction of said rotor; and

ϕ_3 is an angle from said reference position (0°) to a terminating edge of said decreasing radius portion in the rotational direction of said rotor; and

wherein acceleration of protrusion of each vane is substantially low at an initiating edge of said increasing radius portion.

4,802,831

FLUID MACHINE WITH RESIN-COATED SCROLL MEMBERS

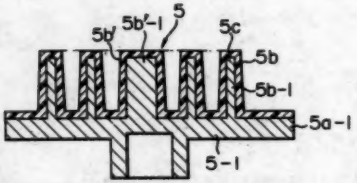
Kazutaka Suefuji, Shimizu; Aizo Kaneda, Yokohama; Yasuyuki Kanai, Shimizu; Shozo Nakamura, Yokohama; Tetsuya Arata, Shimizu; Katsuaki Kikuchi, Tsuchiura; Takao Sensiu, Shizuoka; Kimiaki Nakakado, Shimizu; Eiji Maeda, Shimizu, and Sadatsohi Minakawa, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1987, Ser. No. 37,849

Claims priority, application Japan, Apr. 11, 1986, 61-82045; May 28, 1986, 61-121131; Jun. 2, 1986, 61-125787

Int. Cl.[4] F04C *18/04, 29/00*

U.S. Cl. 418—55 **19 Claims**



1. A scroll type fluid compressor including a stationary composite scroll member and an orbiting composite scroll member, each of said composite scroll members having a substantially circular end wall and a generally spiral wrap formed on and extending axially from one side of said end wall, said scroll members being disposed such that their wraps are engaged with each other to cooperate together and with the end walls to define working chambers, and driving means for causing said orbiting scroll member to make an orbiting motion relative to said stationary scroll member so that said working chambers are moved radially to change volumes thereof, each of said scroll members including a metallic base scroll member having an end wall portion and a substantially spiral wrap portion extending axially from one side of said end wall portion and a coating layer of a resin composition formed on at least the entire surface of said side of said end wall portion, including surfaces of said wrap portion, wherein said spiral wrap of each of said composite scroll members terminates in an inner end portion which is generally bulbous as viewed axially of the scroll member, and wherein said resin composition includes a thermosetting resin and an inorganic filler and has a linear thermal expansion coefficient of not greater than 2.8×10^{-5} cm/cm/°C. and a glass transition temperature of not lower than 160° C.

4,802,832

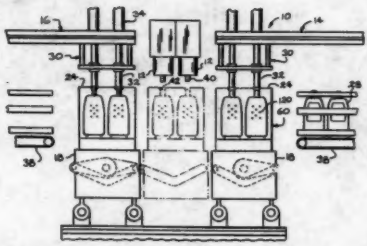
IN-MOLD LABELING ACCESSORY FOR A BLOW MOLDING MACHINE

Thomas A. Shapler, Bowling Green, Ohio, assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Oct. 22, 1987, Ser. No. 112,263

Int. Cl.[4] B29C *49/24*

U.S. Cl. 425—126.1 **12 Claims**



1. An accessory for a continuous blow molding machine of the type having an elongated blow pin insertable within a parison for forming articles wherein said accessory places labels into a mold cavity such that the labels become bonded to the article during molding, said accessory comprising:

a label magazine positioned above said mold cavity for storing a plurality of said labels,

a carriage assembly having a vertically movable portion slidably mounted above said mold cavity,

a pick-up head coupled to said vertically movable portion, said pick-up head having at least one pick-up arm pivotable between an extended and a retracted position, said pick-up head further having a vacuum head carried by an end of said arm and pivotable with respect to said arm, said vacuum head carrying at least one vacuum cup,

first actuation means for translating said movable portion along the side of said blow pin between a first position in which said vacuum cup is in registry with said label magazine, to a second position wherein said vacuum cup is in registry with the mold cavity, and

second actuation means for pivoting said pick-up arm from said retracted position to said extended position wherein, when said carriage movable portion is at said first position, said pick-up arm is pivotable to said extended position causing said vacuum cup to engage the label from said magazine and said pick-up arm being further pivotable to said retracted position and thereafter said carriage movable portion is retracted position and thereafter said carriage movable portion is movable to said second position whereat said pick-up arm is again pivoted to said first position to deposit the label into said mold cavity, and said movable portion is therefore movable to said first position to again position said vacuum cup in registry with said magazine shield means for protecting said label and for aligning said pick-up head to a predetermined orientation when said actuation means is in said retracted position.

4,802,833

ACCUMULATOR HEAD FOR PRODUCING A STORAGE DRUM WITH VIEW STRIPE

Thomas A. Shapler, Bowling Green, Ohio, assignor to Hoover Universal, Inc., Ann Arbor, Mich.

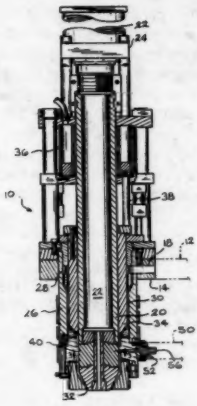
Filed Mar. 21, 1988, Ser. No. 170,784

Int. Cl.[4] B29C *47/06*

U.S. Cl. 425—131.1 **3 Claims**

1. In an accumulator head for a blow molding machine for extruding a tube of plastic material wherein said head includes a mandrel, a die body enclosing said mandrel to define therewith an annular outlet orifice, a first inlet orifice, an annular

accumulation chamber in communication with and located between said inlet and outlet orifices, and an annular piston movable in said accumulation chamber so as to discharge accumulated first plastic material therein through said outlet orifice, means operatively associated with said mandrel and said die body between said accumulation chamber and said outlet orifice to form a radially extending split in said first



plastic material as said first plastic material is discharged through said outlet, a second inlet orifice for injection of a second plastic material into said split in the flow stream of said first plastic material as said first plastic material exits through said outlet orifice whereby the total extruded plastic flowing out of the annular outlet orifice forms a tube having a strip of said second plastic material in said tube extending longitudinally thereof.

4,802,834

ERROR DETECTOR FOR VARIOUS SET VALUES OF AN INJECTION-MOLDING MACHINE

Noriaki Neko, Hachioji, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

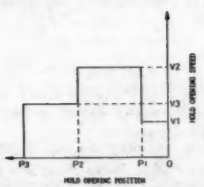
PCT No. PCT/JP87/00045, § 371 Date Sep. 21, 1987, § 102(e) Date Sep. 21, 1987, PCT Pub. No. WO87/04388, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 23, 1987, Ser. No. 104,107

Claims priority, application Japan, Jan. 24, 1986, 61-12141

Int. Cl.[4] B29C *45/77, 45/80*

U.S. Cl. 425—138 **5 Claims**



1. An error detector for various set values of an injection-molding machine controlled by means of a numerical control unit, comprising:

input means receiving input data respectively associated with set values of various items of molding conditions, said molding conditions including at least one of damping conditions, selection conditions, injection conditions and metering conditions;

memory means for storing the set values of the various items of said molding conditions;

discrimination means for determining whether input data of said various items, manually input through said input means, fulfill requirements related to said items, said discrimination means being operable to compare sizes of input data related to individual requirements and determining whether said input data fulfill their corresponding requirements when the input data have predetermined size relations;

memory control means for controlling said memory means to store said input data as set values of said items when said discrimination means concludes that said requirements are fulfilled, said injection molding machine being operated in accordance with the stored set values; and

alarm means, adapted to deliver an alarm when said discrimination means concludes that said requirements are not fulfilled, for preventing errors by setting errors of said set values and a resultant wrong operation of said injection-molding machine.

4,802,835

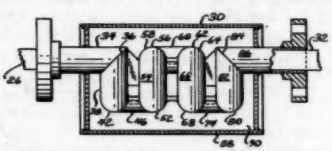
APPARATUS FOR MAKING SOAP

Salvatore J. Silvis, Lambertville, N.J., and Jameel H. Jabbour, Marietta, Ga., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 855,593, Apr. 25, 1986, abandoned. This application Nov. 4, 1987, Ser. No. 117,217

Int. Cl.[4] B29C *47/36*

U.S. Cl. 425—205 **9 Claims**



1. An apparatus for making soap, comprising:

an extruder having a helical screw for passing the soap directly from the screw to an orifice plate having an opening and forming an extrudate by the orifice plate adjacent a downstream portion of the extruder; and

static means for working the extrudate to remove residual screw lines and prevent cracking of soap formed from the extrudate, comprising a plurality of generally straight pipe sections connected by bends, with some of said pipe sections being disposed in first and second spaced planes, and other of said pipe sections connecting the first and second planes.

4,802,836

COMPACTION DEVICE FOR CONCRETE BLOCK MOLDING MACHINE

Gilles Whissell, 635 Watson Dr., Lachute Quebec, Canada J8H 4H1

Filed Jul. 13, 1987, Ser. No. 73,228

Int. Cl.[4] B28B *3/06*

U.S. Cl. 425—253 **8 Claims**

1. In a concrete block molding machine of the type comprising:

a stationary mold formed with a plurality of vertical cells, each of said cells having an open top and an open bottom;

closure means located beneath the mold to close the bottoms of the cells of said mold;

means for moving said closure means vertically towards and away from the mold;

means for filling the cells of the mold with a non-slump concrete mix when the closure means has been moved

toward the mold and is closing the bottoms of the cells of said mold;

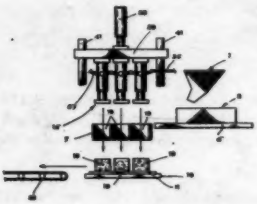
compaction means for applying a compaction pressure onto the mix poured in the cells, said compaction means comprising:

head plate located above the mold;

a plurality of compaction shoes connected to said head plate, said compaction shoes being equal in number to the number of cells in the mold and each sized, configured and positioned above the mold for snug insertion into one of the cells of said mold, and

means for moving said head plate and compaction shoes bodily towards the mold to apply a predetermined compaction pressure over the mix in the cells; and

vibrating means for vibrating the mold while a compaction pressure is applied onto the mix in the cells; the improvement wherein said molding machine further comprises:



a plurality of fluid power jacks equal in number to the number of compaction shoes, each of said power jack supporting one of said shoes and comprising a cylinder and a piston rod telescopically mounted within the cylinder for linear, non-rotatable displacement therein, said displacement being such that each power jack has a working stroke essentially equal to a predetermined allowable difference in height of the concrete block to be molded in the corresponding cell; and

means for interconnecting the power jacks so that the cylinders of all of said power jacks are in fluid communication with each other;

whereby an equal compaction pressure is applied by each compaction shoe in each cell when the compaction means are operated, thereby allowing production of concrete blocks having the same maximum density in all of said cells.

4,802,837

APPARATUS FOR PRODUCING PROCESSED WOOD MATERIAL PANELS

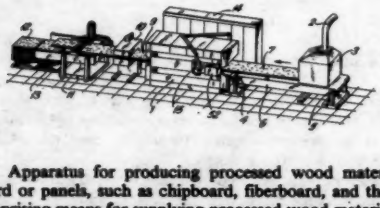
Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Nov. 13, 1987, Ser. No. 120,355

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3639061

Int. Cl.[4] B29C *43/22*

U.S. Cl. 425—230 **101 Claims**



1. Apparatus for producing processed wood material as board or panels, such as chipboard, fiberboard, and the like, comprising means for supplying processed wood material to a support surface for forming a mat and for conveying the mat to a continuously operating double band press, said double band press comprising a first and a second endless press band located opposite one another and forming a passageway therebetween with an inlet at one end of said passageway and an outlet at the other end and a reaction zone extending between the inlet and the outlet ends, said press bands having spaced sides extending between the inlet and the outlet ends, at least two drums in spaced relation for supporting each said press band with said press band travelling over said drums, said press bands arranged to travel the mat through the reaction zone in said passageway, pressure plates arranged in the region of the reaction zone for transmitting pressure to said press bands, said reaction zone comprising a wedge-shaped inlet zone at the inlet end of said passageway, an average pressure reaction zone between said inlet zone and the outlet end, and a lower pressure zone between said average pressure zone and the outlet end, wherein the improvement comprises means located within the inlet zone for supplying one of an acid and basic hardener in one of a gaseous phase and a binary phase with a gaseous carrier agent into the mat in said inlet zone of said passageway.

4,802,838

APPARATUS FOR EXTRUSION OF FOODSTUFFS

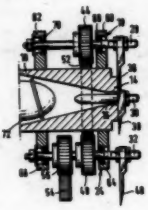
Heinz Schaaf, Quellenweb 14 + 19a, 6277 Bad Camberg-Oberselters, Fed. Rep. of Germany

Filed Nov. 4, 1986, Ser. No. 926,894

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1985, 3515616

Int. Cl.[4] A21C *11/12*

U.S. Cl. 425—311 **8 Claims**



1. Apparatus for extrusion of foodstuffs comprising an extruder screw for feeding the material to be extruded, a nozzle head having a nozzle opening and a cutting means for treating the extruded material, characterized in that on the nozzle head (10, 80) a plurality of cutting blades (36, 38, 40, 42; 92, 94) are rotatably mounted and that the cutting blades are led past the nozzle opening (12, 82) with one said cutting blade being movable over the entire nozzle opening and with each remaining cutting blade being movable over the nozzle opening only at the periphery.

4,802,839

APPARATUS FOR PRODUCING CAST PRODUCTS

Yoshiyuki Hidawa, Tokorozawa, Japan, assignor to Yoshiyuki Corporation, Tokyo, Japan

Filed Mar. 13, 1987, Ser. No. 25,534

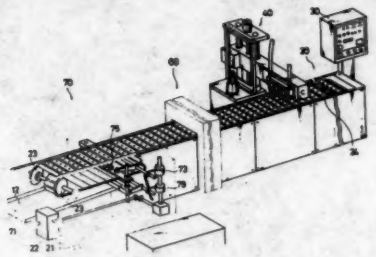
Claims priority, application Japan, Mar. 20, 1986, 61-63671; Jul. 28, 1986, 61-177361; Jul. 28, 1986, 61-177362

Int. Cl.[4] B28B *13/00*

U.S. Cl. 425—439 **5 Claims**

1. Apparatus for producing cast products which comprises a filling unit wherein a non-solid material is filled into elastic moulds having open bag shaped interior filling sections, said filling unit including filling nozzles insertable internally of said filling sections of said elastic moulds, a source of high fluid pressure, and means for applying said high fluid pressure to an exterior surface of said elastic mould filling sections to collapse

said filling sections into surrounding contact with said filling nozzles before said elastic moulds are filled in said filling unit, a solidifying unit wherein the filled material is solidified inside the elastic moulds, a withdrawal unit wherein a solidified product is withdrawn from the inside of said elastic moulds, said withdrawal unit including a movable vacuum chamber, and conveying means moving said elastic moulds sequentially from said filling unit to said solidifying unit to an inverted



position at said withdrawal unit, and means for intermittently moving said vacuum chamber toward and away from the exterior of said inverted elastic moulds at said withdrawal unit, whereby said vacuum chamber covers the inverted filling section of said elastic moulds and expands said elastic moulds thereby permitting cast product removal in a downward direction and then moves away from said elastic moulds permitting movement of said elastic moulds by said conveying means.

4,802,840

DIE FOR MOLDING HONEYCOMB STRUCTURES

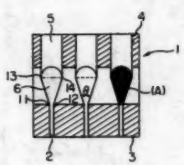
Morio Fukuda; Masayuki Hamada, both of Kitakyushu; Hideo Inutsuka, and Katsuya Ogata, both of Kishima, all of Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo and Iwao Jiki Kogyo Co., Ltd., Saga, both of, Japan

PCT No. PCT/JP86/00139, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/05855, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 26, 1986, Ser. No. 138,843

Int. Cl.[4] B29C *47/30*

U.S. Cl. 425—464 **3 Claims**



1. A die possessing a mutually communicating molding passage having a sectional shape corresponding to that of a honeycomb core and having a predetermined depth from the outlet surface of the die to the inlet surface of the die, and plural mutually independent supply passages that are opposite to intersecting portions and/or acute side portions of said molding passage and have a predetermined depth from the inlet surface of the die to the outlet surface of the die, wherein a through hole for communicating mutually adjacent supply passages is provided at a place forming part of each partition wall between supply passages and connecting with said molding passage; the sectional shape of said through hole takes the combined shape of a trapezoid with the molding passage width as a top side and with the supply passage diameter as a maximum base side and a semicircle having a diameter corresponding to the base side of said trapezoid; an angle formed by extension lines of oblique sides formed by joining both mutually corresponding ends of the top side and the base of said trapezoid is not more than 60 degrees; the ratio of the sectional area (A) of the through hole to the sectional area (B) of the molding passage is in the range of 1.5–3.0; and the length extending from the outlet to the inlet of the molding passage is in the range of 5–10 times as long as the molding passage width.

4,802,841

OPERATION APPARATUS

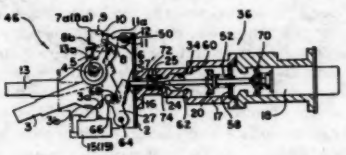
Masahiko Komura, and Masafumi Ohno, both of Aichi, Japan, assignors to Rinnai Corporation, LaGrance, Ga.

Continuation-in-part of Ser. No. 785,703, Oct. 9, 1985, abandoned. This application Jul. 16, 1987, Ser. No. 74,372

Claims priority, application Japan, Dec. 11, 1984, 59-260083

Int. Cl.[4] F23Q *9/08*

U.S. Cl. 431—47 **18 Claims**



1. A device comprising:

a gas burner;

a source of gas connected by a gas pathway to said burner;

an ignitor means positioned adjacent said burner operable for igniting said gas at said burner;

a valve means situated in said gas pathway for selectively opening or closing the gas flow through said pathway;

a first operation lever connected to said valve means and said ignitor means and movable from a starting end position in a first direction, while being normally urged in a second opposite direction, through an intermediate position, to a final end position;

a first switching means for actuating the valve means to open gas flow through said pathway when the first operation lever is in the intermediate position;

a second switch means for actuating the ignition means to cause ignition of said gas at said burner when the first operation lever is in final end position;

locking means which is partially acted upon by and moved along with said first operation lever for allowing said first operation lever to pass through said intermediate position to said final end position to ensure the operation of said ignitor means and for gripping and holding said first operation lever at said intermediate position only after said first operation lever has passed to said final end position to ensure that said valve means is maintained open to allow gas to pass through said pathway;

first spring means for resiliently urging said first operation lever in said second direction; and

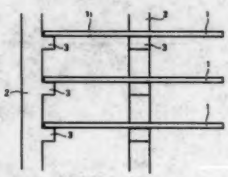
release means which can be brought into engagement with said locking means for releasing and allowing said first operation lever to return to said starting end position.

4,802,842

APPARATUS FOR MANUFACTURING SEMICONDUCTOR DEVICE

Makoto Hirayama, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 884,294, Jul. 10, 1986, abandoned. This application Aug. 4, 1987, Ser. No. 83,020
Claims priority, application Japan, Jul. 15, 1985, 60-156582
Int. Cl.[4] F23D 5/00
U.S. Cl. 432—5 **2 Claims**



1. A method of forming a uniform film on a semiconductor substrate in a heating furnace, comprising the steps of positioning a plurality of semiconductor substrates within a supporting structure having a plurality of supports for holding said plurality of semiconductor substrates in generally parallel, spaced relation to each other, said supports being circumferentially spaced from each other and each support having projections spaced from each other along the support, said projections each having an upward exposed surface contacting to support at least part of a bottom face of each semiconductor substrate and wherein adjacent projections on each support are sufficiently vertically spaced from each other so that the spacing between an upper peripheral surface of one substrate and the bottom surface of an adjacent above projection overlying said upper peripheral surface is considerably greater than the thickness of said substrate; placing the supporting structure containing the stacked substrates within a vertical heating furnace; and introducing a raw material gas within the heating furnace for forming films on the upper surface of the substrates, the said spacing enabling a free flow of said gas along substantially the entire surface of each substrate including substantially the entire peripheral surface thereof to induce a uniform film along the entire surface of each ubstrate, wherein each projection has an upward exposed surface formed with a step portion, and wherein the wherein the upward exposed surface of each projection includes a notched portion defining a step portion having a depth approximately equal to the thickness of the semiconductor substrate so that the upper surface of the substrate exposed to the raw material gas is substantially coplanar with the remainder of the upward exposed surface of the projections located radially outward from the substrate upper surface.

4,802,843

METHOD OF PREPARING SHEETS OF FIBER REINFORCED THERMOPLASTIC RESIN OR SUBSEQUENT MOLDING IN A PRESS

Timothy E. Chilva, Utica, Mich., assignor to Azdel, Inc., Shelby, N.C.

Division of Ser. No. 58,720, Jun. 5, 1987, Pat. No. 4,767,321, which is a division of Ser. No. 937,798, Dec. 4, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 141,012
Int. Cl.[4] F27B 9/28
U.S. Cl. 432—8 **3 Claims**

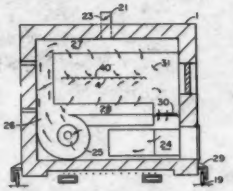
1. A method of preparing sheets of fiber reinforced thermoplastic resin for molding in a press comprising:

continuously pasing sheets of fiber reinforced resin through an oven,

continuously contacting all surfaces of said sheets with circulating hot gases, controlling the temperature of said circulating gases to provide temperatures in excess of the melting temperature of the resin in said sheets,

regulating the circulation rate of the hot gases circulating to provide a gas flow of below 1000 cubic feet per minute in the oven,

controlling the rate of travel of the sheets through the oven to thereby provide a residence time for the said sheets in the oven sufficient to cause the resin in said sheets to become molten throughout the sheets;



passing the gases after contact with said resin sheets through a filtering zone to remove particulates generated by heating the said sheets, reheating the filtered gases and recirculating them to the oven for contact with further of said sheets; and

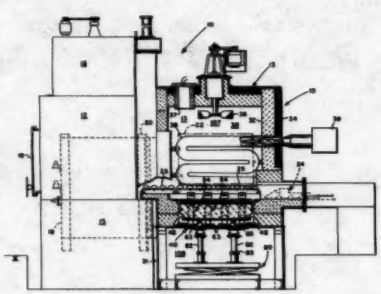
removing the sheets from the oven continuously while the resin therein is molten for placement in the molding press while the resin in the sheet is in a molten or flowable state.

4,802,844

HIGH CAPACITY, RETRACTABLE FURNACE HEARTH

Timothy J. Kuhn; James W. Bender, both of Toledo, and Arvind C. Thekdi, Sylvania, all of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Jan. 20, 1988, Ser. No. 146,195
Int. Cl.[4] F27B 9/14, 5/12
U.S. Cl. 432—126 **29 Claims**



1. A retractable roller hearth arrangement for use in an industrial heat treat furnace having a furnace chamber surroudnign said hearth into which metallic workpieces placed in a work tray are to be heat treated, said hearth comprising:

(a) a refractory base having a bottom surface, a top surface, and a closed peripheral edge surface extending between said bottom and top surfaces;

(b) tile support means extending from said top surface of said refractory base for supporting, when actuated, said work tray when said furnace chamber is heat treating said work;

(c) roller rail means positioned on said top surface of said refractory base and including a plurality of rollers for supporting, when actuated, said work tray and permitting movement of said tray into and out of said furnace chamber in a rolling, anti-friction bearing manner;

(d) hearth lift means for moving said roller rail means relative to said tile means while maintaining said refractory base within said furnace chamber for selectively actuating said roller rail means to support said work tray when said tile support means is not actuated and selectively actuating said tile support means when said roller rail means is not actuated whereby the load-sustaining capacity of said rollers is maintained.

4,802,845

APPARATUS FOR DRIVING ROLLERS OF ROLLER HEARTH KILN

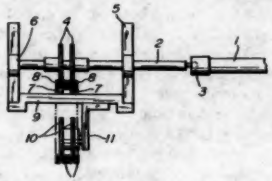
Yasuhiro Kajiura, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Aug. 31, 1987, Ser. No. 91,410

Claims priority, application Japan, Sep. 17, 1986, 61-142395[U]

Int. Cl.[4] F27B 9/24

U.S. Cl. 432—236 **2 Claims**



1. An apparatus for driving rollers of a roller hearth kiln, comprising:

a plurality of driving shafts coupled to corresponding rollers of a roller hearth kiln respectively,

a case extending along the kiln so as to house those ends of the driving shaft therein which ends are away from the kiln,

sprocket wheels secured to said ends of the driving shafts in said case respectively,

a rail disposed on the bottom of the case so as to extend below said sprocket wheels,

a driving chain in a form of a loop including a return path located outside said case and moving on the rail while engaging said sprocket wheels from below,

a tensile sprocket wheel rotatably supporting by a holder and secured to said end of each driving shaft in the bottom of said case, and

an additional rail disposed on the bottom of the case so as to extend below said tensile sprocket wheel,

said driving chain moving on the additional rail while engaging said tensile sprocket wheel from below for applying a tension to the driving chain.

4,802,846

AUTOMATIC SURVEYOR FOR DENTAL MODELS

Jorge E. Posca, Star Road #1, Box 440, Rosemond, Calif. 93560

Filed Apr. 27, 1987, Ser. No. 42,720

Int. Cl.[4] A61C 3/00

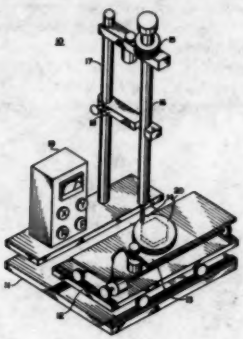
U.S. Cl. 433—75 **5 Claims**

1. Apparatus for dispensing hot wax in a pattern, which comprises:

pressure vessel means for maintaining temperature and pressure of melted wax therein, having an outlet valve for dispensing the melted wax and an input for inserting raw wax material,

means for positioning an article in relation to the outlet valve of said pressure vessel means, in fluid communication with the melted wax effluent from said pressure vessel valve, for forming a melted wax pattern on the article;

controller means for maintaining the temperature of said pressure vessel constant, for maintaining the pressure in said pressure vessel constant, for operating said outlet valve and for controlling said means for positioning an article,



whereby to dispense hot wax at constant viscosity and pressure in a pattern determined by the positioning of the article relative to the dispensing pressure vessel.

4,802,847

DENTAL IMPLANT

Shigeru Komatsu, 7-14-7, Roppongi, Minato-ku, Tokyo, Japan

Filed Sep. 16, 1987, Ser. No. 97,618

Claims priority, application Japan, Nov. 28, 1986, 61-183392[U]

Int. Cl.[4] A61C 8/00

U.S. Cl. 433—176 **8 Claims**

1. A dental implant comprising:

a body having a tortuous cross section with ridges extending from an upper end to a lower end, and a plurality of pointed leg portions at the lower end; and

a head supported on the upper end of the body and adapted to receive an artificial tooth, said head having a generally elliptical transverse cross section with its major axis extending substantially normal to a central plane of said body and a positioning step formed at the lower peripheral portion thereof for engaging the bottom portion of an artificial tooth.

4,802,848

PARAPULPER RESTORATIVE PIN AND DRIVER ASSEMBLY

Jean-Claude Randin, Ballaigues, Switzerland, assignor to Les Fils D'Auguste Maillefer Societe Anonyme A Ballaigues, Switzerland

Filed Jul. 6, 1987, Ser. No. 70,061

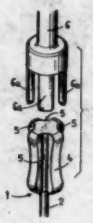
Claims priority, application Switzerland, Jul. 7, 1986, 2.735/86

Int. Cl.[4] A61C 5/04

U.S. Cl. 433—225 **1 Claim**

1. An assembly on the one hand having a parapulper restorative pin for use in dentistry having a stem one end of which is threaded, which includes a weakened breaking zone and which

carries, at its opposed end, a handle permitting to operate it manually, and on the other hand a driving member ensuring the connection between said restorative pin and a motor driving device, in which said handle of said pin is arranged in such a way as to constitute a hold for one of the ends of said driving member arranged in such a way as to engage said handle and which includes a conformation which is reciprocal of said driving member so that once the interengagement is effected,



said driving member is angularly rigid with said handle of said pin and said handle of said pin is provided with several longitudinal grooves distributed angularly regularly around the axis of said pin, said end of said driving member cooperating with said handle being provided with a corresponding number of longitudinal fingers, also distributed angularly regularly around the axis of said driving member, engaging each one of said longitudinal grooves of said handle of said pin.

4,802,849

RAPID MANDIBULAR ADVANCEMENT AND VERTICAL AND LATERAL DEVELOPMENT DEVICE

John A. Collins, Jr., 1116 Mishawaka Ave., South Bend, Ind. 46615

Filed Nov. 27, 1987, Ser. No. 126,026
Int. Cl.[4] A01C *7/00*
U.S. Cl. 433—19 **10 Claims**

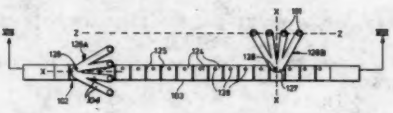
1. A functional appliance adapted to be worn in the mouth of a patient adjacent upper and lower rows of teeth, said appliance comprising an upper part for wearing in an upper part of the mouth adjacent the upper teeth and arch, and a lower part for wearing in a lower part of the mouth adjacent the lower teeth and arch, each upper part and lower part including a rigid tooth positioning part located in abutment behind upper and lower incisor teeth in said patient's mouth, flexible metal positioning wires extending rearwardly of each positioning part located adjacent upper and lower molars in said patient's mouth, each positioning part including magnet means for, mating the positioning parts to position said incisor teeth in a substantially vertical bite plane which promotes movement of said mandible into an ideal bite position.

4,802,850

DENTAL-PORCELAIN COLOR MATCHING SYSTEM

David G. Boon, Pinhays, Herring Road, South Pool, Kingsbridge, S. Devon, United Kingdom

Filed Apr. 21, 1987, Ser. No. 41,834
Claims priority, application United Kingdom, Apr. 22, 1986, 8609778
Int. Cl.[4] A61C *19/10*
U.S. Cl. 433—26 **3 Claims**



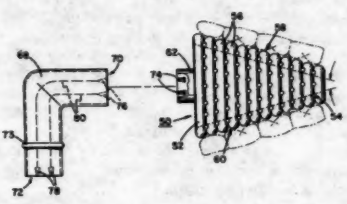
2. A dental-porcelain color matching system comprising a plurality of dental-porcelain beads of different colors carried on a support adapted to allow at least some of said beads to be moved apart so that each said bead can be placed individually against a patient's natural tooth for color comparison with that tooth without color interference from any other bead on said support, wherein said support comprises an elongate body part with a stepped surface and a plurality of respective pivot points, the arms projecting from a respective said pivot point in a common plane and each arm carrying a said bead at its free end, wherein each said group is pivotally attached at its pivot point to a respective step of said stepped surface such that said groups lie in planes parallel to said steps and overlap each other in a stored condition of the system so that the beads are closely spaced but all are visible, and wherein each group is pivotable in its plane into a position for said color comparison.

4,802,851

DENTAL APPLIANCE

Clark J. Rhoades, 181 Tweed Blvd., Nyack, N.Y. 10960

Filed Feb. 3, 1988, Ser. No. 152,033
Int. Cl.[4] A61C *17/04*
U.S. Cl. 433—93 **20 Claims**



1. A combination jaw rest and ejector device, comprising:

(a) a generally hollow, closed, wedge-shaped body having longitudinal upper and lower channels formed on the sloped upper and lower edges thereof, said body and said channels being dimensioned such that said body may be inserted into one side of a patient's mouth, with several upper teeth of said patient removably fitting into said upper channel and with several lower teeth of said patient removably fitting into said lower channel, such that said body holds open said patient's mouth;

(b) a plurality of holes defined through at least one side of said body; and

(c) communicating means to permit communication of said holes and the interior of said body with a source of vacuum;

whereby, airborne liquid and solid materials may be drawn from said patient's mouth, through said communicating means, and to said source of vacuum.

4,802,852

IRRIGATED DRILL AND QUICK-RELEASE CHUCK ASSEMBLY

John J. Shea, Memphis, Tenn., assignor to Richards Medical Company, Memphis, Tenn.

Filed Oct. 10, 1986, Ser. No. 917,669
Int. Cl.[4] A61C 1/14
U.S. Cl. 433—127 3 Claims

1. A drill comprising an elongate hollow casing defining a nose portion at a front end thereof and an electric motor in the other end,

a bur having an elongate shank with opposite flats on a free end thereof and an annular groove spaced from said flats,

bearing means in said nose portion for rotatably supporting the bur shank,

said motor having a drive shaft with a slotted end for accommodating the flatted end of the bur shank for rotatably driving the bur,

and a chuck for releasably holding the bur shank in the slotted end of the motor shaft,

said chuck comprising annular bearing means and a sleeve engaged around the bearing,

the bearing means closely surrounding the bur shank and being engageable into the annular groove,

said sleeve having limited freedom to move transversely of the length of the bur shank, the bearing means being moveable inwardly into the groove to thereby block outward movement of the bur shank from the slotted end of the motor drive shaft and being moveable outwardly of the groove to thereby unblock the bur shank,

spring means engaged between the casing and the sleeve whereby to bias the same so as to cause said bearing means to move inwardly into the groove,

and a manually operable plunger having one end attached to the sleeve and the other end extending outwardly of the casing whereby, upon pressing said plunger inwardly the bearing race is caused to move outwardly of the groove.

4,802,853

METHOD AND APPARATUS FOR PRESERVING AND REIMPLANTING A TOOTH

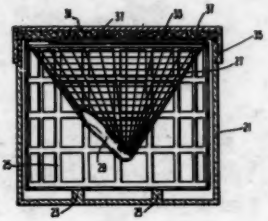
Paul R. Krauser, Pottstown, Pa., assignor to Biological Rescue Products, Inc., Pottstown, Pa.

Continuation-in-part of Ser. No. 880,088, Jun. 30, 1986, Pat. No. 4,689,014. This application Aug. 20, 1987, Ser. No. 87,206
The portion of the term of this patent subsequent to Aug. 25, 4004, has been disclaimed.
Int. Cl.[4] A61C 5/00
U.S. Cl. 433—215 16 Claims

1. A method of preserving an exarticulated tooth, comprising the steps of:

(a) placing the tooth in a container, the container having a cushioning means on its interior, at least part of the cushioning means comprising a non-liquid material attached to the container, the container being substantially filled with a solution,

(b) storing the tooth in the container, in the solution, until dental said is available,



(c) removing the tooth from the container, and

(d) reimplanting the tooth.

4,802,854

EDUCATIONAL BLOCKS

Pauline D. Davis, 42 Redwood Rd., Severna Park, Md. 21146

Filed Apr. 25, 1988, Ser. No. 185,898
Int. Cl.[4] G09B 1/06; A63H 33/10
U.S. Cl. 434—159 6 Claims

1. A set of educational letters and/or numerals comprising a plurality of relatively thin blocks of uniform thickness, each in the shape of a letter of the alphabet or numeral and having extended lower portions, and

a main support track having a longitudinal groove in its upper face of substantially the same width as the thickness of each block, for snug reception of said extended lower portions or other edge portions of the blocks, and

one or more auxiliary support tracks of shorter length but having similar grooves, whereby blocks can be supported individually and one block can be stacked on top of another in any desired orientation.

4,802,855

WORD ASSOCIATION LABEL TEACHING METHOD

Harry E. Wood, 6465 Oakland Dr., New Orleans, La. 70118

Filed May 17, 1988, Ser. No. 195,038
Int. Cl.[4] G09B 19/08
U.S. Cl. 434—157 1 Claim

1. A "Word Association Label Teaching Method" for teaching a foreign language consisting of:

(a) peel off and restickable labels upon which are printed foreign language words such as nouns, verbs, adjectives, etc., to be adhered to the object to which the word refers;

(b) sheets (pages) upon which English words are listed alphabetically followed by several peel off labels with the foreign language equivalent of that word printed on them as described in part (a);

(c) a cover or binding means designed to hold many sheets or pages as described in part (b);

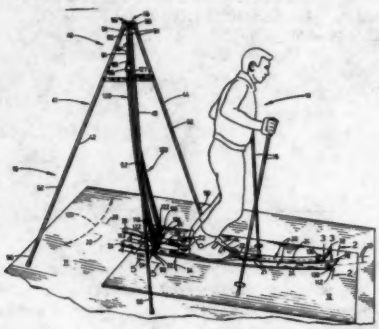
(d) the peel off labels described in part (a) are of different colors to indicate nouns, verbs adjectives, etc.

4,802,856

APPARATUS FOR TRAINING SKIERS

Bruce R. Olson, 458 S. Clovis Ave., #105, Fresno, Calif. 93727

Filed Oct. 26, 1987, Ser. No. 112,620
Int. Cl.[4] A63B *69/18*
U.S. Cl. 434—253 **6 Claims**



1. Apparatus for training a skier wearing a pair of skis, the apparatus comprising:

a tripod adapted to be rested on a supporting surface in upright relation, the tripod further having an apex;

a chain releasably mounted on the tripod adjacent to the apex, the chain adjustable as to length relative to the apex;

a support frame mounted on the rearward portion of each ski and having a channel substantially cylindrically shaped in cross section disposed substantially transversely of the longitudinal axis of each ski, and a plate having a portion slidably received in the channel;

a pair of resilient cords having opposite ends individually interconnecting the rearward portion of each ski with the chain, each resilient cord mounted at one end on one of the plates and mounted at the opposite end on the chain, the resilient cords individually operable to position the rearward portion of each ski in an elevated position with respect to the supporting surface; and

a forward support assembly mounted on the forward portion of each ski and disposed in rested relation on the supporting surface in supporting relation to said forward portion of each ski, the forward support assembly permitting substantially independent pivotal movement of the respective skis substantially about their respective longitudinal axes to permit the skier wearing said skis to simulate skiing maneuvers, and the plate operable to release the rearward portions of the skis from said elevated positions upon rotation of the skis sufficiently about their respective longitudinal axes to cause said portions of the plates to slide from said channels.

4,802,857

CPR MASK

Patrick E. Laughlin, 1191 Beechwood Dr., Green Bay, Wis. 54303

Filed Nov. 23, 1987, Ser. No. 124,289
Int. Cl.[4] G09B *23/28*
U.S. Cl. 434—265 **17 Claims**

1. A hygienic mask that is fitable to an existing CPR dummy and comprising;

(a) a mask fabricated of a thin conformable material and having an inside surface and an outside surface,

(b) air passages formed in the mask and the passages are indexable in air passages of a face of a CPR dummy, and the air passages have as a part thereof, filter chambers configured to receive and hold replaceable filters,

(c) a cling producing means which causes the inside, face contacting surface of the mask to cling to the face of the CPR dummy, and

(d) an attachment means distributed around the periphery of the mask whereby the periphery of the mask is releasably secured to the face portion of the CPR dummy and the attachment means is retrofitable to the face of an existing CPR dummy without permanent modification of the dummy.

4,802,858

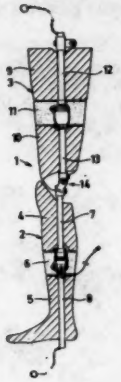
DEVICE FOR TEACHING TREATMENT OF SKELETON INJURIES

Kjell Lindskog, Skellefteå, and Jan Sandegard, Östersund, both of Sweden, assignors to Procare AB, Skellefteå, Sweden

PCT No. PCT/SE86/00052, § 371 Date Oct. 14, 1986, § 102(e) Date Oct. 14, 1986, PCT Pub. No. WO86/04711, PCT Pub. Date Aug. 14, 1986
PCT Filed Feb. 7, 1986, Ser. No. 928,282
Claims priority, application Sweden, Feb. 11, 1985, 8500604
Int. Cl.[4] G09B *23/32*
U.S. Cl. 434—274 **8 Claims**

1. A device for teaching treatment of a skeletal injury comprising: an artifical body part having two spaced-apart portions made of shape-permanent material; an elongated bone-simulating member in the form of a pipe in each portion of the body part, said members projecting from their respective portions of shape permanent material and having end portions located outside their respective body portions of shape permanent material and in the space between said body portions and facing each other so as to form a place of simulated skeletal injury; means for applying a counter force to said bone-simulating members when they are separated from each other in the longitudinal direction of said members; and means operable from outside the body part for releasably locking said members against being moved angularly relative to each other, said locking means including a locking pin movable between a

position wholly within one pipe and a position partially within both pipes, said device further including means for applying a



resilient force to said pin in the longitudinal direction of the pipes.

4,802,859

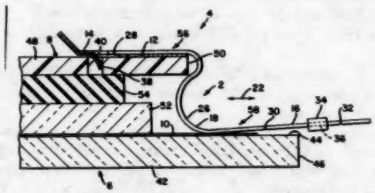
ELECTRICAL CONNECTOR

Thomas E. Gouldy, South Williamsport; William C. Knoll, Turbotville; Ernest R. Ritter, deceased, late of Lewisburg (by Faye E. Ritter, executrix); Thomas M. Lynch, Williamsport; Ronald E. Steffey, Cochranton, all of Pa.; Donald R. White, Warwich, R.I., and Robert E. Brown, Stratham, N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 1, 1988, Ser. No. 176,502

Int. Cl.[4] H01R 9/09

U.S. Cl. 439—74 **15 Claims**



1. An electrical connecting device for use with a multiple layered circuit-containing device wherein at least two layers of said multiple layered circuit-containing device each contain a circuit including circuit contacts to be electrically connected from layer to layer by said electrical connecting device, said electrical connecting device comprising:

an upper longitudinal peripheral surface joined to a lower longitudinal peripheral surface by an intermediate longitudinal surface to form an elongated member having a longitudinal direction, a transverse direction and a Z-like configuration when viewing a transverse cross-section of said elongated member,

a row of elongated apertures being provided in said intermediate longitudinal surface, said row extending in said longitudinal direction, and each elongated aperture in said row of elongated apertures extending in said transverse direction and being spaced in the longitudinal direction from an adjacent elongated aperture by a Z-shaped connector of electrically conductive material formed by said intermediate longitudinal surface, each elongated aperture being spaced in said longitudinal direction from an adjacent elongated aperture in a predetermined amount to effect a moiré pattern when superimposed relative to said circuit contacts of at least one layer of said at least two layers.

4,802,860

SURFACE MOUNT TYPE ELECTRICAL CONNECTOR

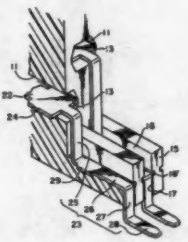
Shigeru Kikuta, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1988, Ser. No. 162,577

Claims priority, application Japan, Mar. 4, 1987, 62-31588[U]; Mar. 4, 1987, 62-31589[U]

Int. Cl.[4] H01R 9/09

U.S. Cl. 439—79 **9 Claims**



1. A surface mount type electrical connector comprising:

an insulating housing having a plurality of contact receiving apertures;

a plurality of contacts each mounted in each of said contact receiving apertures;

said contact having a contacting section for contact with a mating connector contact, a terminal portion to be connected to a conductor of a printed circuit board, and an intermediate section between them having a pair of broadened engaging members;

said contact receiving aperture having a pair of grooves for receiving said broadened engaging members to retain said contact therein; and

a plurality of receiving channels each communicating with said receiving aperture for receiving a rear section of said contact behind said broadened engaging members in such a manner that said rear section may be slidably movable in said grooves.

4,802,861

SELF-ALIGNING ELECTRICAL CONNECTOR

Lynn S. Gaston, Fort Worth, Tex., assignor to Boeing Vertol Company, Ridley Park, Pa. and Bell Helicopter Textron Inc., Fort Worth, Tex., a part interest

PCT No. PCT/US87/01361, § 371 Date Jun. 15, 1987, § 102(e) Date Jun. 15, 1987, PCT Pub. No. WO88/10525, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 15, 1987, Ser. No. 132,943

Int. Cl.[4] H01R 13/625, 13/64

U.S. Cl. 439—247 **8 Claims**

1. An electrical connector assembly, comprising:

a female coupler having a longitudinal axis, a threaded socket on said axis, and a pin socket extending parallel to said axis;

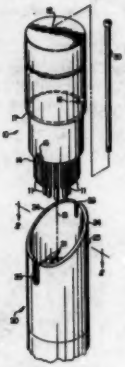
an open-ended cylindrical standpipe attached to said female coupler and extending axially therefrom;

said open end of said standpipe having a rim forming a cam, said cam sloping to a slot in said standpipe that extends axially toward said female coupler;

a male coupler having a longitudinal bore along a coupler axis and a pin extending from said male coupler parallel to said male coupler axis;

a cam follower extending radially outward from said male

coupler, said cam follower following said cam during connection of said couplers, thereby rotating said male coupler about said coupler axis so that said cam follower engages said slot to align and engage said pin with said pin



socket, said cam follower comprising a lug and a cylindrical roller mounted on and rotatable about said lug; and

a jackscrew extending through said bore for engaging said threaded socket to connect said couplers.

4,802,862

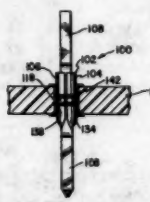
SOLDERABLE ELECTRICAL CONTACT

Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corporation, Flushing, N.Y.

Continuation of Ser. No. 248,800, Mar. 30, 1981, abandoned. This application Oct. 6, 1983, Ser. No. 538,851

Int. Cl.[4] H01R 9/09

U.S. Cl. 439—83 2 Claims



1. A contact element adapted to form one member of an electrical connection arrangement having mating male and female members, comprising:

a body having an engaging surface conforming substantially to a corresponding surface on the mating member;

said body having a peripheral groove communicating with said engaging surface;

a deposit of solder in said groove, said solder including a peripheral ridge portion projecting away from the groove and extending beyond said engaging surface, said ridge portion being adapted to be at least partially displaced from the remaining solder in said groove upon mating of said members;

whereby, upon mating of said members, at least a portion of said ridge of solder is externally visible at the juncture of said mated members;

said contact member further including at least one longitudinal channel communicating with and substantially perpendicular to said groove.

4,802,863

DEVICE FOR ELECTRICAL CONNECTION OF TWO COMPONENTS

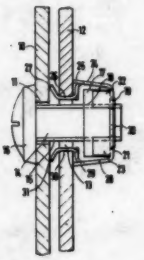
Jurgen Debus, Dietzholztal, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Herborn, Fed. Rep. of Germany

Filed Apr. 25, 1988, Ser. No. 185,448

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714500

Int. Cl.[4] H01R 9/24

U.S. Cl. 439—387 10 Claims



1. In an electrical connection device of the type having first and second principal components with opposed flat areas, first and second aligned boreholes in the first and second components, respectively, a bolt with a shank extending through the boreholes from a front surface of the first principal component, and a nut engaging the shank against a back surface of the second principal member and having a free side away from the second principal component, the principal components of metal with a non-conductive coating, the improvement comprising:

the second borehole, adjacent the nut, being larger than the bolt shank such that there is substantial clearance between the shank and the edge of the second borehole;

a claw retainer non-rotatably secured on the free side of the nut;

a side leg connected to the claw retainer and having a first claw engaging the back surface of the second principal component; and

an extension extending from the claw member, passing through said clearance, and having a second claw engaging the first principal component on its surface opposite the front surface.

4,802,864

RIGHT ANGLE STRAIN RELIEF ADAPTER FOR ELECTRICAL CONNECTORS

Leonard H. Michaels, Warrenville, and Robert A. Miller, Woodridge, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

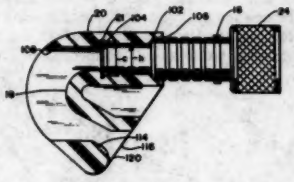
Division of Ser. No. 5,095, Jan. 20, 1987, Pat. No. 4,758,174. This application Apr. 22, 1988, Ser. No. 184,725

Int. Cl.[4] H01R 13/58

U.S. Cl. 439—457 5 Claims

1. An adapter to provide strain relief for an electrical connector having a cable extending therefrom, said adapter including a connector mounting channel whose ends are exposed to the exterior of said adapter, at least said connector mounting channel being dimensioned to be removably mounted to said electrical connector, said adapter further defining a cable channel angularly aligned at an angle substantially greater than zero degrees to said connector mounting channel and having ends which are exposed to the exterior of said adapter, at least a portion of said cable channel being dimensioned to frictionally retain the cable therein, whereby the connector mounting channel of the adapter may be mounted over the cable of the

electrical connector and securely but removably mounted on the electrical connector, and whereby the cable may be



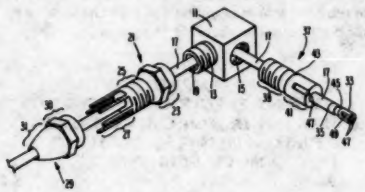
threaded through and frictionally retained in the cable channel.

4,802,865

CABLE CONNECTOR ARRANGEMENT TO ACCOMMODATE AN ANGULAR CABLE LAYOUT

Vernon F. Albert, Misty Hollow R.D.#3, Glen Mills, Pa. 19342

Filed Apr. 2, 1987, Ser. No. 34,007
Int. Cl.[4] H01R *13/59*
U.S. Cl. 439—461 5 Claims



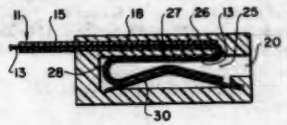
1. A cable connector arrangement to accommodate an angular cable layout comprising in combination: housing means having a wall defining the outside thereof and being formed to have a substantially hollow chamber inside said housing means; said housing means having first and second wall sections formed to respectively define first and second apertures through said wall into said hollow chamber with the axis of said first aperture disposed to lie at an angle less than 180° from the axis of said second aperture; said first wall section and said second wall section further formed to be threaded in order to be respectively connectable to first and second cable connector means; first cable connector means formed to be threaded in order to be connected to said first wall section; said first cable connector means further formed to include a plurality of finger like structure means, each having a secured end formed integral with support means and disposed so that when viewed together said secured ends define an endless configuration, each of said finger like structure means having a free end with said free ends disposed so that a space is formed between each of said finger like structure means and any adjacent ones of said finger like structure means and wherein said first cable connector means further include a compression nut means having an aperture therethrough and formed to fit over said finger like structure means whereby when said compression nut means is moved over said finger like structure means they pass through said aperture in said compression nut to effect a clamping action on a cable passing through said finger like structure means and said compression nut; and second cable connector means formed to be threaded in order to be connectable to said second wall section and further formed to be secured to said cable whereby a cable can be passed through said first cable connector means and connected thereto, through said hollow chamber, and through said second cable means and connected thereto to form a cable layout which defines an angle of less than 180°.

4,802,866

CONNECTOR

Alfiero Balzano, 4333 Sunny La., Yorba Linda, Calif. 92680, and Dan Dove, 2102 Chateau, Anaheim, Calif.

Filed Aug. 10, 1987, Ser. No. 83,070
Int. Cl.[4] H01R *13/04*
U.S. Cl. 439—496 2 Claims



1. A solderless electrical connector for releasably joining opposite ends of multiple contact flexible circuitry comprising:

a first and second length of flexible circuitry having a plurality of electrical conductors carried along their lengths in insulative fixed parallel spaced-apart relationship;

a form defining an open cavity for supporting said first length of flexible circuitry so that said first length of flexible circuitry is folded over upon itself to define a contact closure between opposing surfaces of exposed electrical conductors;

resilient leaf spring means carried on said form within said form cavity yieldably urging said contact closure together, said resilient means comprising a pair of elongated V-shaped members having their opposite terminating ends anchored in said form with a single free end slidably carried on a sloping ramp with the apex of said V-shaped member movably projecting into said form cavity to support said first length of flexible circuitry; and

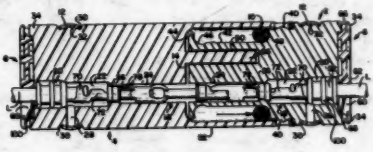
a projection for supporting said second length of flexible circuitry so that said second length of flexible circuitry is folded over said projection to define exposed electrical conductors for mating with electrical conductors of said contact closure when said projection is inserted into said form cavity.

4,802,867

ELECTRICAL CONNECTOR HOUSING ASSEMBLY

James W. Palmer, Watford, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 16, 1987, Ser. No. 121,309
Claims priority, application United Kingdom, Dec. 5, 1986, 8629112
Int. Cl.[4] H01R *13/40*
U.S. Cl. 439—587 9 Claims



1. An electrical connector housing assembly comprising an electrical connector housing having a mating face and a terminal receiving face and defining a plurality of through, terminal receiving cavities each opening into both of said faces, and means projecting from said terminal receiving face and having a latching opening therein, the assembly further comprising a terminal locking cap having latching means thereon for reception in a latching opening provided in means projecting from said terminal receiving face, the cap being resiliently compressible to allow said latching means to be inserted into said open-

ing to secure said cap against said terminal receiving face so as to obturate said cavities, the cap having a plurality of hollow lobes spaced from each other to receive electrical leads extending from electrical terminals between them.

4,802,868

CONTACT SPRING CONNECTOR STRIP

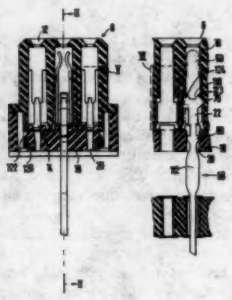
Helmut Rolf, Feucht, and Werner Bock, Kirchensittenbach, both of Fed. Rep. of Germany, assignors to Leonhardy GmbH, Reichenschwand, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,455

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636774

Int. Cl.[4] H01R *13/42, 13/506*

U.S. Cl. 439—689 **17 Claims**



1. A contact spring connector strip comprising:

a housing forming substantially straight elongated contact chambers which are open at opposite ends, including an inlet end, each chamber having an inside wall forming a pair of opposed inwardly-extending longitudinal flanges within the chamber, each flange having an end within the chamber;

contacts each including a contact spring which has two spring clips facing one another and adapted to rest on opposite sides of the flanges and a substantially flat push-in pin with a connector end insertable into one of the contact chambers, said pin oriented substantially parallel to and between the spring clips and having first and second ends inside and outside the housing, respectively;

the push-in pin having at least two tabs near the first end and positioned to engage the flange ends with the push-in pin inserted, the contact spring being affixed to the push-in pin at a position therealong between the tabs and the second end;

a cover attachable to the housing to close the contact chambers, the cover having a passageway for each push-in pin; and

the ends of the pair of flanges within each contact chamber each having a recess facing the direction of insertion of the push-in pin, the recesses positioned and dimensioned to receive said tabs.

4,802,869

PROBEABLE ELECTRICAL CONNECTOR

H. Winston Maue, Farmington Hills, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Aug. 17, 1987, Ser. No. 86,322

Int. Cl.[4] H01R *13/40*

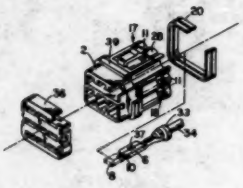
U.S. Cl. 439—587 **5 Claims**

1. A probeable electrical connector assembly comprising:

(a) a plurality of mating electrical connector housings;

(b) each of said mating housings containing means for accommodating at least one terminal which when mated with a corresponding terminal in a mating housing forms a terminal union;

(c) each of said mating housings containing a passage leading to at least one terminal located within the housing whereby the passage provides means for allowing a probe to be inserted to make electrical contact with the terminal when the mating housings are connected to form the assembly;



(d) each of said mating housings having a plurality of passages, said mating housing also having a circumferential groove and wherein at least one of the passages terminates at the groove; and

(e) a removable seal sized to fit snugly in the groove whereby the seal in combination with the groove provides reusable means for covering the passages.

4,802,870

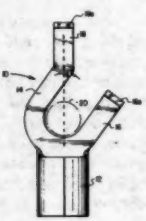
UNIVERSAL ELECTRICAL CONNECTOR

Noel Lee, 47 W. Park Dr., Daly City, Calif. 94015

Filed Oct. 19, 1987, Ser. No. 110,127

Int. Cl.[4] H01R *11/00*

U.S. Cl. 439—860 **5 Claims**



1. An electrical connector comprising a member for receiving an electrical conductor, two parallel legs formed integrally with, and extending from, said member and spaced apart a distance sufficient to accommodate a post of an electrical terminal, each of said parallel legs extending at an angle to the axis of said member, and an extension formed on one of said legs for extending within an opening in another electrical terminal, said extension extending at an angle to said one leg, and the longitudinal axis of said extension coinciding with an extension of an axis of said member.

4,802,871

OUTBOARD ENGINE ARRANGEMENT

Yoshimi Watanabe; Hiroshi Kawamura, and Chiharu Sohda, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,167

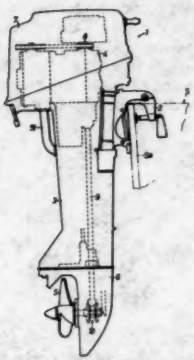
Claims priority, application Japan, Feb. 17, 1986, 61-32638; Feb. 17, 1986, 61-21387[U]

Int. Cl.[4] B63H *5/13*

U.S. Cl. 440—75 **14 Claims**

1. An outboard engine arrangement, comprising an engine; an extension case below said engine; a drive shaft disposed

within said extension case to extend longitudinally therein and connected to a crank shaft of said engine for driving a propeller; a transmission interposed between said crank shaft and said drive shaft for shifting a speed change ratio between said both



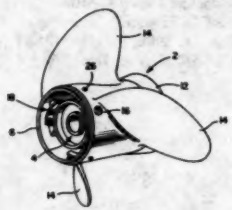
shafts at least at two stages of higher and lower speeds, an oil pan storing lubricating oil for the engine, said oil pan being connected to said engine at a lower surface thereof, said transmission being contained within said oil pan in sealed relation from the interior of the extension case outside the oil pan.

4,802,872

REGULATED AERATION OF GASES EXHAUSTING THROUGH A PROPELLER

Robert Stanton, Box 175, Road #1, Sweet Valley, Pa. 18656

Filed Sep. 5, 1986, Ser. No. 904,151
Int. Cl.[4] B63H *1/28*
U.S. Cl. 440—89 **9 Claims**



1. A propeller comprising:
an inner hub having an outermost wall,
an outer hub having an innermost wall, said outer hub being supported in spaced relation to and surrounding said inner hub,
an annular passageway defined between said outermost wall of said inner hub and said innermost wall of said outer hub,
a plurality of blades mounted on said outer hub,
a plurality of openings defined by said outer hub, each of said plurality of openings being located adjacent to a root of a leading edge of one of said plurality of blades,
reed valve means mounted in said annular passageway, said reed valve means including an elongated reed having a thickness substantially less than its length and width, said elongated reed being positioned in said annular passageway so that the restriction of gas flow through said annular passageway by the thickness of said elongated reed minimizes the blockages of gas flow through said annular passageway, said reed valve means being located adjacent each of said plurality of openings and biased away from each of said plurality of openings for moving towards each of said plurality of openings and at least partially sealing each of said plurality of openings due to centrifugal force acting against a bias of said reed valve means during rotation of the propeller in a predetermined speed range, said plurality of openings being substantially free of blockage by said reed valve means of gas flow through said openings outside of said predetermined spped range due to the bias of said reed valve means away from said plurality of openings, and
anticavitation means for allowing a small amount of gas to escape to an area adjacent to said plurality of blades when said reed valve means covers said plurality of openings.

4,802,873

METHOD OF ENCAPSULATING TFEL PANELS WITH A CURABLE RESIN

William A. Barrow, Aloha, and Richard Schmechtenberg, III, Beaverton, both of Oreg., assignors to Planar Systems, Inc., Beaverton, Oreg.

Filed Oct. 5, 1987, Ser. No. 104,166
Int. Cl.[4] H05B *33/04*
U.S. Cl. 445—6 **4 Claims**

1. A method of manufacturing a matrix addressed AC TFEL device, said device comprising a first transparent electrode layer deposited on a glass substrate and active electroluminescent components deposited on said transparent electrode layer, comprising the steps of:
(a) affixing a rear cover to said substrate, said cover thereby forming a sealed cavity enclosing said active electroluminescent components;
(b) filling said cavity with a material initially having a liquid state which cures to a solid state;
(c) energizing said active electroluminescent components so as to completely illuminate said device for a predetermined time; and
(d) wherein said liquid material cures to said solid material within said predetermined time.

4,802,874

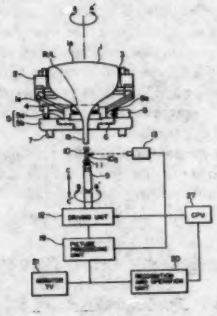
METHOD OF INSTALLING MOUNT ASSEMBLY IN CATHODE RAY TUBE

Koichi Yasuda, Yotsukaido, and Yoshihiko Kimura, Chiba, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1987, Ser. No. 21,396
Claims priority, application Japan, Mar. 19, 1986, 61-59157
Int. Cl.[4] H01J *9/40, 9/42*
U.S. Cl. 445—4 **4 Claims**

1. In a method of sealing a stem structure mounted with an electron gun to the inside of an opening end of a neck portion of a tube of a color cathode ray tube which includes at least a phosphor screen and a shadow mask,
the steps of installing a mount assembly in the cathode ray tube, comprising:
detecting a distance between a standard level of said tube and a standard level of said electron gun in a case where a tube-axis of said tube body and an axis of ordinates of said electron gun are in the same direction;
seeking a correction value by making a comparison between the detected distance and a preset standard distance between the standard level of said tube and the standard level of said electron gun;
decreasing the correction value by moving at least one of

said tube and said electron gun in the direction of the axis of ordinates; and



sealing said opening end of said neck portion of said tube enclosing said electron gun after the correction value has fallen within a predetermined allowable value.

4,802,875

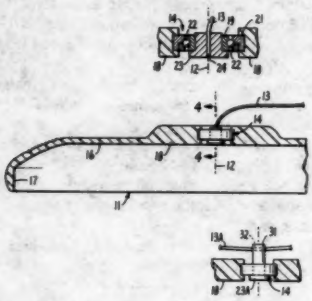
TETHERED FLYING DISC WITH TWO-PIECE BEARING MEANS

Paul E. Cunningham, 4237 Henning Dr., Concord, Calif. 94521

Filed Mar. 6, 1987, Ser. No. 22,656

Int. Cl.[4] A63H *27/00*

U.S. Cl. 446—46 **7 Claims**



1. A flying disc toy, comprising a body of inverted concavo-convex disc shape

having an axis of rotation,

an elongated flexible tether having two ends for controlling said body, and

two-piece bearing means operatively connecting said tether to said body on said axis of rotation for free spinning rotation of said body independent of said tether, wherein a removable plug is inserted in said two piece bearing means, and said elongated flexible tether is engaged with said plug.

4,802,876

AXLE STRUCTURE AND AXLE JOINT FOR CONSTRUCTION TOY ASSEMBLY

Vic Bertrand, Dollard des Ormeaux, Canada, assignor to The Ritvik Group Inc., Dorval, Canada

Filed Sep. 23, 1987, Ser. No. 100,300

Int. Cl.[4] A63H *17/00, 17/26*

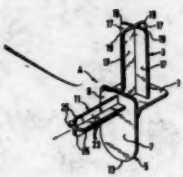
U.S. Cl. 446—95 **12 Claims**

1. A one-piece plastic axle structure comprising:

a base plate having an upper face, a lower face, a straight edge and having a free perimeter;

an abutment plate solid with the straight edge of the base plate, said abutment plate extending perpendicularly to the base plate and having a minor portion projecting up from the base plate, away from the upper face of said base plate, and a major portion projecting down from the base plate, away from the lower face of said base plate, said major portion having a rounded lower end, said rounded lower end having an accessible edge.

a columnar connector of essentially constant cross-section extending upwardly perpendicularly from the upper face



of the base plate, said columnar connector being spaced from the minor portion of said abutment plate;

a reinforcing plate extending perpendicularly to both the abutment plate and base plate, between the major portion of said abutment plate and the lower face of said base plate, and

a shaft projecting perpendicularly from said abutment plate in a direction opposite to said base plate, said shaft having, opposite said abutment plate, a free end formed with outward bulges whereby when said shaft engages a wheel said accessible edge may support said wheel when said axle structure is stressed downwardly.

4,802,877

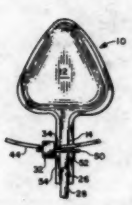
METHOD AND APPARATUS OF TYING THE NECK OF A BALLOON

John C. Davis, Palatine, and James A. Milne, Crystal Lake, both of Ill., assignors to CTI Industries, Barrington, Ill.

Filed Feb. 10, 1988, Ser. No. 154,317

Int. Cl.[4] A63H *3/06*; B65H *69/04*

U.S. Cl. 446—222 **17 Claims**



1. A hand tool adapted to secure a flexible neck of an inflatable balloon against fluid leakage, said hand tool comprising:

a housing having a forward end portion and a rearward end portion each positioned on the longitudinal axis of the housing, said housing having an exterior lateral surface between the end portions for manual grasping to rotate the housing about its longitudinal axis;

first and second elongate legs mounted in adjacent position in the forward end of the housing and extending outwardly of the housing to a position along the extension of said longitudinal axis of the housing, said legs being adapted to receive the neck of the balloon therebetween in a starting position preparatory to a tying operation; and

a supply of continuous tying line having a free end positioned adjacent and in alignment with one of said legs when the legs are in starting position, whereby rotation of

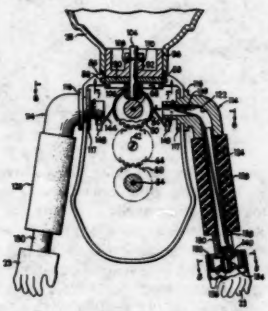
said housing and legs rolls the balloon neck into tight convolutions about said free end and legs to a tying position, and subsequent withdrawal of the legs from the convolutions permits the free end of the line captured within the convolutions to be securely tied about the convolutions to prevent fluid leakage through the balloon neck.

4,802,878

DOLL WITH ROTATING AND BENDABLE ARMS

Rouben T. Terzian, Chicago, and Walter J. Wozniak, Addison, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 6, 1987, Ser. No. 11,903
Int. Cl.[4] A63H *3/28*
U.S. Cl. 446—300 13 Claims



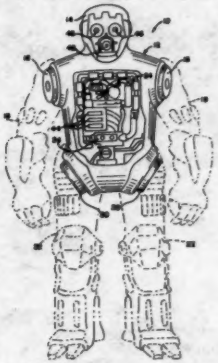
1. A doll comprising in combination:
a torso;
an arm carried by the torso;
the arm having a shoulder at one end adjacent to the torso and a hand at the other end;
the arm being mounted for rotational movement relative to the torso at the shoulder, shoulder rotation means adjacent to the shoulder to cause rotation of the arm at the shoulder, said arm is bendable intermediate the shoulder and the hand,
a hollow resilient flexible tube intermediate the shoulder and the hand;
a cable passing through the tube;
one end of the cable being connected to the hand; and
the other end of the cable passing through the shoulder in the torso and being connected to control means carried by the torso that movement of the control means in a predetermined direction tightens the cable and bends the arm upwardly from an at rest position down alongside of the torso and also causes the shoulder rotation means to rotate the arm relative to the torso at the shoulder.

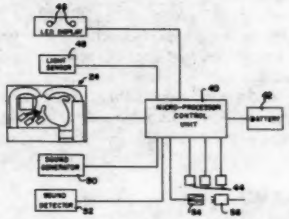
4,802,879

ACTION FIGURE TOY WITH GRAPHICS DISPLAY

Owen R. Rissman, Northbrook, Ill., and Henry T. H. Tai, Chaiwan, Hong Kong, assignors to Tiger Electronics, Inc., Vernon Hills, Ill.

Filed May 5, 1986, Ser. No. 859,699
Int. Cl.[4] A63H *3/16, 3/28*
U.S. Cl. 446—175 10 Claims





9. An action figure toy construction having animated characteristics, comprising:
a humanoid torso portion for said action figure construction configured to resemble a human torso;
graphics display means mounted on said torso portion and comprising a liquid crystal graphics display, said graphics display means being configured to display a plurality of simulated life functions and being operable to correspond to a plurality of varying levels of activity for said action figure construction to lend animated characteristics to said construction, said levels of activity including modes wherein said graphics display means reflects differing activities for said action figure toy construction, with the rate at which the features of said graphics display means are operated varying commensurate with the mode of the graphics display means;
micro-processor means operatively connected to said graphics display means for effecting operation and control thereof, including variations in said plurality of levels of activity of said simulated life functions displayed by said graphics display means; and
at least one switch means on said torso portion, said switch means being operatively connected to said micro-processor means whereby operation of said switch means effects alteration of the simulated life functions shown by said graphics display means, said micro-processor means including timer means for generating an electrical timer signal reflecting the passage of time,

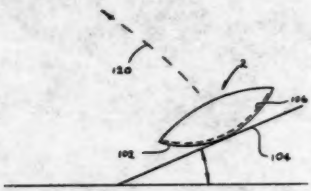
said graphics display means including a numerical display operatively connected with said timer means for displaying changing numerals reflecting passage of time to provide a display of the age of said action figure toy construction.

4,802,880

LEAPFROG AND FOOTBALL GAME

Christopher Shaw, 163 Oakes Drive, Mississauga, Ontario, Canada L5G 3M2

Filed Apr. 15, 1987, Ser. No. 38,603
Int. Cl.[4] A63F 7/06; A63H 11/06
U.S. Cl. 273—94 11 Claims



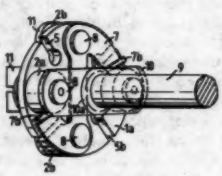
1. A game comprising:
(a) a board having football field representations thereon;
(b) a device moveable relative to said board and having an angularly selectively adjustable surface relative to said board; and
(c) a jumping toy having an original stable shape in the form of a thin flexible convex surface with two curved perimetral edge formations, said convex surface adapted to bear against said angularly adjustable surface, wherein said jumping (top) toy is manipulatively elastically deformable against said angularly adjustable surface so as to leap from said angularly adjustable surface when said convex surface returns to its original stable shape to land on said board.

4,802,881

COUPLING MEMBER FOR TAKING UP TORQUE IN A VEHICLE STEERING COLUMN AND A VEHICLE STEERING COLUMN ASSEMBLY

Michael T. Hancock, Coventry, England, assignor to The Torrington Company Ltd., Coventry, England

Filed Aug. 10, 1987, Ser. No. 83,618
Claims priority, application United Kingdom, Aug. 11, 1986, 8619527
Int. Cl.[4] F16D 3/70, 3/78
U.S. Cl. 464—93 15 Claims



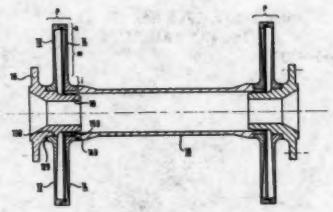
1. A coupling member for taking up torque in a vehicle steering column comprising: a disc with bosses extending from each face of the disc, said disc having a cut-out portion between adjacent bosses, each cut-out portion extending generally radially of said disc and serving to accommodate deflection of the coupling member in use thereof; each face of the disc having a fail-safe deflection plate located to take up thrust by reacting against opposed bosses upon torque being applied through said bosses.

4,802,882

DIAPHRAGM DISK ASSEMBLY FOR TORQUE TRANSMITTING JOINT AND PROCESS FOR ITS FABRICATION

Günther Heldrich, Burgberg, Fed. Rep. of Germany, assignor to BHS - Bayerische Berg-, Hütten- and Salzwerke AG

Continuation of Ser. No. 808,459, Dec. 12, 1985. This application Mar. 17, 1988, Ser. No. 169,088
Claims priority, application European Pat. Off., Jul. 26, 1985, 85109402.9
Int. Cl.[4] F16D 3/79
U.S. Cl. 464—99 10 Claims



1. A torque transmission unit comprising a first joint part (16) and a second joint part (10) defining an axis and interconnected by a diaphragm disk assembly (12, 14),
said diaphgram disk assembly (12, 14) comprising a pair of adjoining concentric diaphragm disks (12, 14), each of said diaphragm disks (12, 14) having an annular radially outer edge area (a) , an annular radially inner edge area (i) and an annular radially middle area (m) extending between said outer and inner edges areas (a, i), said middle areas having a radial dimension greater than the radial dimensions of said outer and inner edge areas, said diaphragm disks having radially extending oppositely directed front faces in said middle areas and outer edges areas with said front faces being planar and extending perpendicularly to the axis of said second joint part, said front faces being imperforate and free of support external of said diaphragm disks, said diaphragm disk (12, 14) being connected adjacent respective radially inner peripheries each to a different one of said first (16) and said second (10) joint parts in said radially inner areas and being connected to each other adjacent respective radially outer peripheries in said outer edge areas, said diaphragm disks (12, 14) being provided adjacent their radially outer peripheries in said outer edge areas with axially directed annular projections facing oppositely to said front faces and directed towards each other, the annular projection of a first said diaphragm disk (12) being provided with a radially inner axially directed base face (124) and a radially outer axially directed annular extension, the axial projection of a second said diaphgram disk (14) being provided with a radially outer axially directed base face (141) spaced radially outwardly from said base face (124) of said first diaphgram disk and a radially inner axially directed annular extension, said radially inner annular extension being located radially inwards of and located opposite said radially outer annular extension, a Z-shaped butt joint being defined between said annular extensions and base faces, a radially outer zone of said Z-shaped butt joint being defined by an axially directed end face (121) of said radially outer annular extension and said radially outer base face (141), a radial intermediate zone of said Z-shaped butt joint being defined between a radially inwardly directed circumferential centering face (122) of said radially outer annular extension and a radially outwardly directed cir-

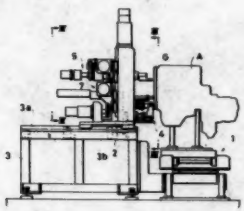
cumferential centering face (142) of said radially inner annular extension and a radially inner butt joint zone of said Z-shaped butt joint being defined by said radially inner base face (124) and an axially directed end face (144) of said radially inner extension, an annular disk-shaped electron beam welding zone (20) being provided in said radially outer butt joint zone extending radially inwardly from radially outermost circumferentially faces (128, 148) of said first and second diaphgragm disks to said radially outwardly directed circumferential centering face (142) for connecting said end face (121) of said radially outer annular extension and said radially outer base face (141), and the radial dimension of said welding zone (20) corresponding at least to the radial dimension of said outer based face (141) and being greater than the radial dimension of said radially inner annulur extension.

4,802,883

METHOD OF AND APPARATUS FOR ADJUSTING TENSION OF TIMING BELT

Kanji Tominaga; Toshihiro Hijikata; Katsuhiro Yamaguchi; Yoshimichi Matsumoto, and Yasuo Watanabe, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 107,311
Claims priority, application Japan, Oct. 13, 1986, 61-241288; Aug. 7, 1987, 62-196465
Int. Cl.[4] F16H 7/10
U.S. Cl. 474—101 26 Claims



1. A method of adjusting the tension of a timing belt in an engine, the engine having an engine body, a crankshaft in the body, on one side of the engine body a driving pulley on the crankshaft, a driven pulley on a camshaft of a valve operating mechanism, an auxiliary pulley, a timing belt bridged over the driving pulley, the driven pulley, and the auxiliary pulley, and a tension pulley for pressing a loose side portion of the timing belt from outside, characterized by carrying out the following steps in order, reversely rotating the driving pulley in a reverse rotational direction opposite to a normal rotation direction when the engine is running so that loose side portion of the timing belt is tensioned at its region extending between the auxiliary pulley and the driven pulley, under the condition that the driven pulley is fixedly held in position; normally rotating the driving pulley in the normal rotational direction so that a tension side portion of the timing belt is brought into an over-tensioned condition, while the tension pulley is being pushed and advanced toward the timing belt; and retracting the tension pulley while the driving pulley is rotated in the reverse direction so that defection of the tension side portion of the timing belt may reach a predetermined target adjustment value, and thereafter fixing the tension pulley at a retracted position.

4,802,884

METHOD OF FOLDING INTO PACKAGES DISPOSABLE ABSORBENT ARTICLES, E.G. DIAPERS, IN CONNECTION WITH THE PRODUCTION THEREOF

Arne Fröldh, Stenungsund, and Lennart Persson, Billdal, both of Sweden, assignors to Molnlycke AB, Goteborg, Sweden

PCT No. PCT/SE87/00333, § 371 Date Feb. 19, 1988, § 102(e) Date Feb. 19, 1988, PCT Pub. No. WO88/00441, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 10, 1987, Ser. No. 175,387
Claims priority, application Sweden, Jul. 17, 1986, 8603153
Int. Cl.[4] B65B 63/04
U.S. Cl. 493—339 2 Claims

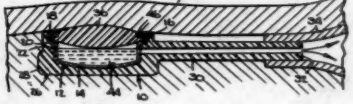
1. A method of folding into packages, in connection with the manufacture thereof, disposable absorbent articles such as diapers, or incontinence protectors comprising an absorbent body (1) enclosed in a casing extending laterally beyond the absorbent body and having casing portions intended to seal around the abdomen of the wearer, as well as elastic leg means in the form of elastic bands or threads (6,7) affixed to the casing with portions (6',7') extending at least partially along either side edge of the article at a distance beyond the absorbent body, characterized in that the ends of the article are folded in with approximately equal lengths towards the mid-section of the article which is thereafter folded together in the same direction into a four-folded state, the elastic portions (6',7') at the center of the article simultaneously being held laterally stretched so as to encompass the laterally positioned article ends, the folded article upon release of said elastic portions being held together thereby in the state of a compact, four-folded package.

4,802,885

SELF SEALING SUBCUTANEOUS INFUSION AND WITHDRAWAL DEVICE

Vaughan B. Weeks, and Jeffrey E. Bark, both of Racine, Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed Jun. 17, 1986, Ser. No. 875,421
Int. Cl.[4] A61M 11/00
U.S. Cl. 604—93 18 Claims



1. A self-sealing subcutaneous infusion and withdrawal device comprising, a cup-shaped needle stop member having a wall portion defining a mouth, and a base opposite said mouth, a fluid transfer opening formed in said wall portion, a jacket member enveloping said needle stop member, said jacket member including a fluid transfer tube aligned with the fluid transfer opening of said needle stop member, a needle penetrable seal member for sealing the mouth of said needle stop member, said seal member having opposite convex surfaces, one of said convex surfaces extending into said needle stop member and the other of said convex surfaces extending away from said needle stop member, said other surface having a peripheral ledge, and clamping means for clamping said peripheral ledge of said seal member to the mouth of said needle stop member.

4,802,886

CONTINUOUS PROCESS FOR THE DYEING OF POLYMERS

John R. B. Boocock, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Sep. 25, 1987, Ser. No. 100,901
Int. Cl.[4] D06P 7/00, 3/79
U.S. Cl. 8—489 11 Claims

1. A continuous process for the dyeing of melt-extrudable polymers capable of being dyed, said process comprising extruding molten polymer through an orifice, contacting the extruded polymer while still in the molten state with an aqueous solution of a dye for said polymer, and withdrawing the resultant dyed polymer from the aqueous solution, said polymer being selected from the goup consisting of:

A. a polyamide;

B. a polyester;

C. a direct copolymer that is a copolymer of an alpha-olefin having the formula R—CH=CH_2, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, with at least one alpha, beta-ethylenically unsaturated carboxylic acid having from 3 to 8 carbon atoms, the acid moieties being randomly or non-randomly distributed in the polymer chain, the carboxylic acid content being 0.5–50% by weight of the direct copolymer, any other copolymerized monomer being monoethylenically unsaturated;

D. an ionomer of a direct copolymer;

E. a graft copolymer obtained by grafting 0.1 to 20 percent by weight of at least one alpha-, beta-unsaturated carboxylic acid having 3 to 8 carbon atoms or unsaturated carboxylic acid anhydride onto a preformed polyolefin backbone derived from ethylene or ethylene and C_3 to C_8 alpha-olefin, in which polyolefin backbone any other optionally copolymerized monomer component is monoethylenically unsaturated; and

F. blends of at least one C, D or E with a hydrocarbon polymer derived from at least one monomer of the formula R—CH=CH_2, where R is as defined above.

4,802,887

COMPOSITIONS COMPRISING A WATER-SOLUBLE METAL COMPLEX DYE, AN OXYALKLATED AMINE SULPHATE ESTER AND A DISPERSING AGENT

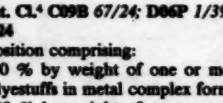
Kamal Ateya, Binningen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 879,242, Jun. 26, 1986, abandoned. This application Mar. 10, 1987, Ser. No. 24,287
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 3522981
Int. Cl.[4] C09B 67/24; D06P 1/39, 3/32
U.S. Cl. 8—524 24 Claims

1. A composition comprising:

(a) 30 to 90 % by weight of one or more water soluble anionic dyestuffs in metal complex form,

(b) 0.5 to 20 % by weight of one or more compounds of formula I



(I)

in which R_1 is C_{12-22}alkyl or C_{12-22}alkenyl;

R_2 is hydrogen or $-SO_3M$;

m is 2, 3 or 4;

n is 2, 3 or 4;

p+p' is 10 to 30 inclusive, each of p and p' being at least 1; and M is a cation; and

(c) 5 to 40 % by weight of a dispersing agent which is a condensation product of ditolylether sulphonate and formaldehyde or of naphthalene sulphonic acid and formaldehyde or is a lignin sulphonate or a oxylignin sulphonate,

said percentages being based on the dry weight of the total composition.

4,802,888

DRY DYESTUFF POWDERS WITH ENHANCED WATER SOLUBILITY

Charles W. Sandefur, and Thomas J. Thomas, both of Summerville, S.C., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1987, Ser. No. 117,856
Int. Cl.[4] C09B 67/42
U.S. Cl. 8—524 9 Claims

1. A composition comprising a dry dyestuff powder containing less than 12% by weight water wherein said composition comprises:

(i) an anionic water soluble dye

(ii) about 2 to about 12% of a chelating agent which is characterized in that it contains at least two free acid groups, said percents being relative to the weight of said powder and

(iii) a sufficient amount of a Lewis base to bring the pH of a solution of said powder in water to about 7 to 10, selected from the group consisting of lithium hydroxide, amine and amine carbonate.

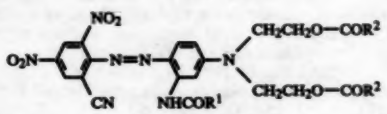
4,802,889

2-CYANO-4,6-DINITROPHENYL MONO-AZO DYES FOR POLYESTER AND CELLULOSE ACETATE

Ulrich Bte,ssml/u/ hler, Alzenau; Horst Tappe, Dietzenbach; Reinhard Kilba, Frankfurt; Albert Bode, Schwalbach, and Margareta Boss, Hattersheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 896,811, Aug. 15, 1986, abandoned. This application Aug. 24, 1987, Ser. No. 88,831
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3533960
Int. Cl.[4] C09B 29/08, 43/42; D06P 1/18, 3/36
U.S. Cl. 8—639 13 Claims

1. Monoazodyestuff of the formula



wherein

R^1 is alkyl having 1 to 3 carbon atoms and

R^2 is alkoxy having 1 to 4 carbon atoms which is unsubstituted or substituted by methoxy or ethoxy.

4,802,890

AGGLOMERATION OF COAL FINES

Robert F. Vlies, Tamworth, England, assignor to Fosroc International Limited, Birmingham, England

Filed Mar. 9, 1987, Ser. No. 23,389
Claims priority, application United Kingdom, Apr. 8, 1986, 8608488
Int. Cl.[4] C10L 5/14, 5/06
U.S. Cl. 44—21 14 Claims

1. A process for the agglomeration of coal fines comprising (a) producing a mixture which consists essentially of (i) coal fines, (ii) a phenol-formaldehyde resole resin in alkaline aqueous solution, and (iii) a curing agent for the resin, the curing agent being at least one ester selected from the group consisting of esters of polyhydric alcohols, carbonate esters and lactones, (b) forming the mixture into agglomerates and (c) drying and curing the agglomerates.

5. A process according to claim 1 wherein the amount of

alkali present is 20–60% by weight based on the weight of phenol-formaldehyde resin.

4,802,891

COAL-METHANOL SLURRY AND ITS PRODUCTION PROCESS

Izumi Yamada, Tokyo; Tetsuya Oishi, Kamakura, and Kazuhiko Hanashita, Kitakyushu, all of Japan, assignors to Mitsui Mining Company, Limited and Mitsui Toatsu Chemicals, Incorporated, both of Tokyo, Japan

Continuation of Ser. No. 861,439, May 9, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 171,152
Claims priority, application Japan, Apr. 15, 1986, 61-85073
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 6 Claims

1. In a coal-methanol slurry of coal particles and methanol as principal components, the improvement comprising:

a slurry comprising from 42.7–73.6 wt. % coal particles in a liquid medium comprising methanol and water and from 0.005–5 wt. % of at least one compound selected from the group consisting of partially-desulfonated lignosulfonic acids and salts thereof, based on the weight of the coal-methanol slurry, wherein the total water content of the slurry ranges up to 30 wt. %, which water content includes 2–25 wt. % of water added to the slurry in addition to the inherent moisture of the coal particles; said coal particles having a maximum particle size not greater than 1500 μm and a cumulative particle size distribution of 30–65 wt. % of 74 μm and smaller particles, 10–25 wt. % of 10 μm and smaller particles and 5–15 wt. % of 3 μm and smaller particles, the concentration of the coal particles being within a range which satisfies the relationship:

$$X-34.0 \leqq Y \leqq X-15.1$$

wherein X designates the degree of coalification expressed in terms of wt. % carbon in the coal particles and Y denotes the concentration (wt. %) of the coal particles in the slurry.

4,802,892

FUEL OIL ADDITIVE AND FUEL OIL HAVING IMPROVED FLOWABILITY

Takeo Shimada; Tsutomu Isaka; Noriyuki Okada; Iwao Ishino, and Nobuhiro Usami, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1986, Ser. No. 908,797
Claims priority, application Japan, Sep. 24, 1985, 60-210805
Int. Cl.[4] C10L *1/18*
U.S. Cl. 44—62 9 Claims

1. A middle distillate fuel oil having a difference between a 20% and 90% distillation temperature of less than 100° C. and having improved flowability, consisting essentially of a fuel oil and 10 to 2,000 ppm by weight, based on the weight of the fuel oil, of a flowability improver consisting essentially of an ethylenic copolymer being derived from:

(a) ethylene, and

(b) at least one monomer selected from the group consisting of vinyl esters of saturated carboxylic acids, ethylenically unsaturated mono- or di-carboxylic acids and esters thereof having the formula:

wherein R^1 represents hydrogen or a methyl group, R^2 represents the group —$OCOR^4$ or —$COOR^4$ in which R^4 represents hydrogen or an alkyl group having 1 to 18 carbon atoms, and R^3 represents hydrogen or the group —$COOR^4$ in which R^4 is as defined above, and having a number average molecular weight of less than 1,000 and a (b) component content of 1 to 25 mol %, and containing 2 to 10 alkyl branches per 100 methylene groups.

4,802,893

MODIFIED SUCCINIMIDES

Robert H. Wollenberg, San Rafael, and Frank Plavac, Novato, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 096,426, Sep. 11, 1987, Pat. No. 4,747,850, which is a division of Ser. No. 897,190, Aug. 15, 1986, which is a continuation-in-part of Ser. No. 722,939, Apr. 12, 1985, Pat. No. 4,612,132, which is a continuation-in-part of Ser. No. 632,777, Jul. 20, 1984, abandoned. This application Apr. 20, 1988, Ser. No. 183,803
Int. Cl.[4] C10M *133/16*
U.S. Cl. 252—49.6 66 Claims

1. A product prepared by the process which comprises reacting at a temperature sufficient to cause reaction

(a) a multiply adducted alkenyl or alkyl succinimide wherein one or more of the nitrogens of the multiply adducted alkenyl or alkyl succinimide is substituted with hydroxyhydrocarbyl oxycarbonyl wherein the hydroxyhydrocarbyl group of said hydroxyhydrocarbyl oxycarbonyl contains from 2 to 20 carbon atoms and 1 to 6 hydroxy groups with the proviso that there is no hydroxy substitution on the hydrocarbyl carbon atom attaching the hydroxyhydrocarbyl group to the oxy atom of the oxycarbonyl group and with the further proviso that when more than one hydroxy group are contained in the hydroxyhydrocarbyl group, no more than one hydroxy group is attached to the same carbon atom and the number of carbon atoms in the hydroxyhydrocarbyl group is minimally one greater than the number of hydroxy groups and wherein said multiply adducted alkenyl or alkyl succinimide is derived from a multiply adducted alkenyl or alkyl succinic anhydride charcterized by the presence within its structure of an average of greater than 1 succinic group for each equivalent of alkenyl or alkyl group; with

(b) a boron compound selected from the group consisting of boric acid, boron oxides, boron halides and esters of boric acid employing from about 0.1 equivalents to 10 equivalents of boron compound per equivalent of the multiply adducted alkenyl or alkyl succinimide of (a) above.

4,802,894

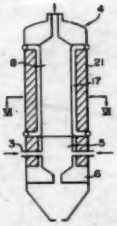
METHOD OF USING A STRUCTURAL MEMBER OF ANTI-SULFUR-ATTACK CR-NI-AL-SI ALLOY STEEL FOR COAL GASIFICATION SYSTEM

Kenichi Usami; Seishin Kirihara, both of Hitachi; Tadaoki Morimoto, Ibaraki; Hiroyuki Doi, and Michiya Okada, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 795,777, Nov. 7, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 2,285
Claims priority, application Japan, Nov. 9, 1984, 59-234981
Int. Cl.[4] C10J *3/76*
U.S. Cl. 48—77 2 Claims

1. A method of using an alloy steel in a coal gasification furnace comprising subjecting a water-cooled tube wall to a hot gas atmosphere comprising H_2, CO, CH_4 and H_2S produced through reaction between coal and a gasifier, wherein said water-cooled tube wall is made of an anti-sulfur attack

Cr-Ni-Al-Si alloy steel having a composition consisting essentially of, by weight, 0.03–0.3% of C, 1–10% of Si, not greater than 2.0% of Mn, 10–14% of Ni, 16–18% of Cr, 0.5–10% of Al, 2–3% of Mo, and the balance not less than 50% of Fe.



4,802,895

COMPOSITE DIAMOND ABRASIVE COMPACT

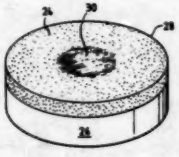
Richard P. Burnand, 39 Constantia Ave., Alan Manor, Johannesburg, Transvaal, and Kenneth A. Mackenzie, 215 Oak Ave., Ferndale, Randburg, Transvaal, both of South Africa

Filed Jul. 7, 1987, Ser. No. 70,369

Claims priority, application South Africa, Jul. 14, 1986, 86/5237

Int. Cl.[4] B24D *3/00*

U.S. Cl. 51—293 5 Claims



1. A metohd includes the steps of:
(a) providing a reaction capsule for a high temperature/high pressure apparatus;
(b) loading the reaction capsule by placing therein a cemented carbide body, a thin layer of "fine" carbide powder of average particle size less than 2 microns on a surface of the carbide body, and a mass of "fine" diamond particles of average particle size less than 20 microns on the layer of carbide powder;
(c) placing the loaded reaction capsule in the reaction zone of the high temperature/high pressure apparatus;
(d) subjecting the contents of the reaction capsule to elevated conditions of temperature and pressure suitable to form a composite diamond abrasive compact; and
(e) recovering the composite diamond abrasive compact from the reaction capsule.

4,802,896

MODIFIED RESINS AND ABRASIVE ARTICLES MADE WITH THE SAME AS A BOND SYSTEM

Kam W. Law, Oakdale, and Walter W. Goethel, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 8, 1987, Ser. No. 129,826

Int. Cl.[4] C09K *3/14*

U.S. Cl. 51—298 11 Claims

1. An abrasive product having abrasive grain and a resin bond system, said resin bond system comprising cured hard resin and sufficient thermally stable aromatic ligand to provide said abrasive product with improved abrasive performance over that of an abrasive product having the same resin bond system without said ligand, the amount of ligand in said resin bond system being at least 3% by weight based upon the combined weight of the ligand and resin.

4,802,897

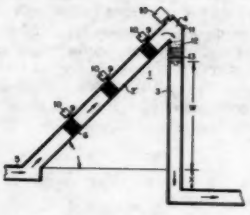
RECOVERY OF GASES FROM NON-VISCOUS SOLVENTS

Arthur F. Johnson, 240 Fox Dr., Boulder, Colo. 80303

Filed Aug. 5, 1986, Ser. No. 893,425

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—55 19 Claims



1. The process of continuously separating a more volatile substance from a non-viscous liquid in which it is dissolved comprising:
(a) flowing the liquid through a vertical conduit having portions extending radially outwardly and radially inwardly, the portions extending radially outwardly each having a pattern of shaped, spaced obstructions disposed therein, said flow being controlled to take place at a sufficient velocity to cause bubbles of said volatile substance to form due to centripetal separating force caused by flow-stream curvature around the shaped obstructions; and
(b) continuously removing the bubbles of the volatile substance from the nonviscous liquid before they redissolve in the liquid.

4,802,898

METHOD AND APPARATUS FOR REMOVING CYANOGEN CHLORIDE FROM AIR

Edward D. Tolles, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,082

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—71 16 Claims

1. In a method for removing cyanogen chloride from an air stream containing cyanogen chloride using a carbon containing filter, the improvement comprising said carbon having an effective amount of triethyleneamine added thereto in the absence of chromium.

16. Type AS whetlerite charcoal impregnated with triethylenediamine in an amount effective for removing cyanogen chloride from an airstream containing cyanogen chloride.

4,802,899

PRESSURE SWING ADSORPTION APPARATUS

Edward E. Vrana, West Seneca, and Ravinder K. Bansal, Amherst, both of N.Y., assignors to AirSep Corporation, Buffalo, N.Y.

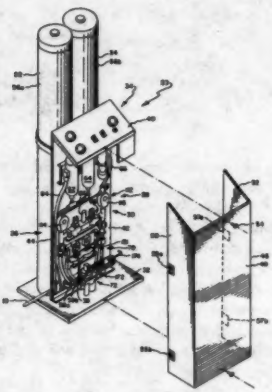
Filed Sep. 21, 1987, Ser. No. 98,879

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—161 16 Claims

1. In a pressure swing adsorption apparatus including a pair of adsorbers each having an inlet and an outlet and adapted to fractionate at least one constituent from a gaseous mixture delivered from a feed stream by sequentially directing the gaseous mixture from the feed stream into the inlet of one

adsorber so that said one adsorber performs adsorption while simultaneously purging the other adsorber of adsorbed constituent with product gas withdrawn from the outlet of the one adsorber and then directing the gaseous mixture from the feed stream into the inlet of the other adsorber so that said other adsorber performs adsorption while simultaneously purging the one adsorber of adsorbed constituent of product gas withdrawn from the outlet of the other adsorber wherein the apparatus includes feed and waste valving means associated with the inlets of the adsorbers to which the gaseous mixture is selectively routed to the inlet of one or the other adsorber for the production of product gas and through which product-depleted waste gas is discharged from the adsorber being purged and a purge loop and equalization valving means associated with the outlets of the adsorbers permitting the adsorbers to communicate with one another through the outlets thereof for the purposes of purging one and then the other of the adsorbers and for equalizing the internal pressure of the adsorbers between preselected stages of adsorber operation, the improvement comprising:



a base;

an elongated control box for housing the feed and waste valving means of the apparatus, said control box being directly mounted upon said base so that its longitudinal axis is oriented generally vertically and including a substantially planar back oriented generally vertically, the valving means of the apparatus are supportedly attached to said planar back in a substantially coplanar and vertical arrangement facilitating service and maintenance of said valving means, and

said pair of adsorbers include a pair of towers directly mounted upon said base and oriented in a generally vertical, side-by-side arrangement and positioned in such a relationship with the control box so that the back panel of the control box is positioned adjacent and so as to span the width of the adsorber towers, the towers and the control box being attached to one another so that the vertical stability of each of the towers and control box contributes to the vertical stability of each of the other of the towers and control box.

4,802,900

LABORATORY ANIMAL CARRIER FILTER BAG

Keith R. Ball, 16 Winans Pl., Piscataway, N.J. 08854, and David M. Thompson, 423 Cross Rd., Matawan, N.J. 07747

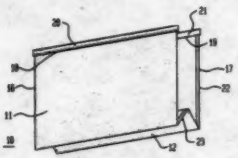
Filed Mar. 12, 1987, Ser. No. 25,255

Int. Cl.[4] B01D *39/16*

U.S. Cl. 55—381 **6 Claims**

1. A container comprising:

a continuous length of spun polyester sheet which is folded so as to form first and second side portions and a bottom portion continuously with, and intermediate of, said first and second side portions, said bottom portion being folded onto itself so as to be expandable, said first and second side portions each having lateral edges and a top edge, and being joined at respective ones of said lateral edges to one another;



polyethylene seal means installed intermediate of said folds in said folded bottom portion, said folded bottom portion being sealed continuously on respective sides thereof with said first and second side portions; and

a polyethylene seal for closing an opening defined by said top edges of said first and second sides, said opening being distal from said bottom portion.

4,802,901

LIQUID SEPARATOR

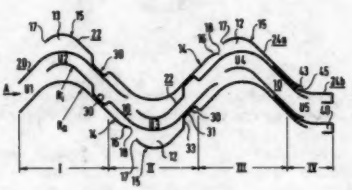
Dieter Wurz, Riefstahstr. 6, D-7500 Karlsruhe 1, and Max Zimmermann, Karlsruhe, both of Fed. Rep. of Germany, assignors to Dieter Wurz, Fed. Rep. of Germany

Filed Aug. 13, 1987, Ser. No. 84,918

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627555

Int. Cl.[4] B01D *45/08*

U.S. Cl. 55—440 **16 Claims**



1. A liquid separator for separating liquid components entrained in a two-phase flow (gas/liquid), in which the flow is passed through a channel provided with one or more trap pockets for the liquid components, said pockets each having a leading edge associated therewith and an associated guide plate upstream thereof which at its end has separating edges for the liquid, in which the separating edge (18) of each guide plate (14) is disposed at a distance (b) upstream of the leading edge (17) of the associated trap pocket (12), characterized in that the end of each guide plate (14) is curved in the direction leading into the trap pocket (12) in such a way that the tangent (t) to the separating edge (18) of the guide plate (14) extends into the trap pocket (12), that the velocity is substantially constant at least in the vicinity of the opening between guide plate and trap pocket, and that the end of the guide plate (14) which has the separating edge (18) is provided with a bent portion (16) having a length (l) the maximum value of which is determined from the equation

$$l_{max} = m \cdot \frac{h}{\eta} \cdot \ln \frac{u(0)}{u(1)}$$

wherein u(0) is the mean film velocity at the beginning of the

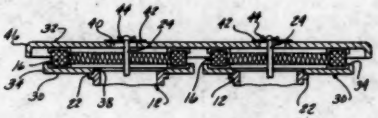
bent portion, and u(1) is the mean film velocity at the separating edge and $2.5 < u(0)/u(1) \leqq 3.5$, m is the same mass flow per unit of width, h is the mean film thickness, and η is the dynamic viscosity of the liquid, and wherein the practical length (l) of the bent portion (16) is in the range of $0.2l_{max} < l \leqq l_{max}$.

4,802,902

AIR CLEANER COVER AND BASE FOR DUAL CARBURETOR ASSEMBLIES

David D. Bauerle, St. Clair Shores, and Barry I. Rabotnick, Southfield, both of Mich., assignors to Colt Industries Inc., New York, N.Y.

Filed Jun. 10, 1987, Ser. No. 66,354
Int. Cl.[4] B01D 46/00
U.S. Cl. 55—484 13 Claims



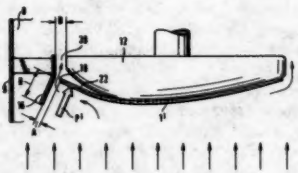
4. In combination with a dual throttle body assembly including a pair of throttle bodies each having a circular air cleaner flange and a pair of annular air filter elements of an inner diameter greater than the diameter of said flange, an air cleaner cover and base plate assembly for mounting said filters in operative relationship upon said throttle bodies, said cover and base plate assembly comprising a pair of circular base plates each operable to support one of said air filter elements thereon, each of said plates having an eccentrically located circular opening therethrough adapted to receive said air cleaner flange of one of said throttle bodies to support said base plate thereon and to accommodate rotative adjustment of said plate relative to said one of said bodies, and a single cover means for clamping said pair of said filter elements respectively upon said pair of base plates located respectively on said flanges of said pair of throttle bodies.

4,802,903

METHOD AND APPARATUS FOR CURVING A GLASS SHEET

Hans-Werner Kuster, Aachen; Norbert Schwarzenberg, Herzogenrath, both of Fed. Rep. of Germany, and Luc Vanaschen, Eupen, Belgium, assignors to Saint-Gobain Vitrage, Paris, France

Filed Sep. 14, 1987, Ser. No. 95,850
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632556; Sep. 25, 1986, 8625618[U]
Int. Cl.[4] C03B 23/035
U.S. Cl. 65—106 12 Claims



1. A method of curving a glass sheet which has been heated to its bending temperature, comprising blowing a hot gas stream with a large cross-sectional area against said sheet, to press said sheet against a curved forming surface of a curving form,

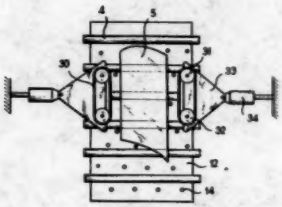
increasing the static pressure component of the hot gas stream at at least one region adjacent a portion of the periphery of said form where said surface is sharply curved, by means of a barrier positioned adjacent to, but spaced from, said periphery portion and extending below said glass sheet when applied against said frame.

4,802,904

METHOD AND APPARATUS FOR POSITIONING OF GLASS PLATES TO BEND THEM INTO A CONVEX SHAPE

Philippe Boutier, Thourotte, France, and Luc Vanaschen, Eupen, Belgium, assignors to Saint-Gobain Vitrage, Paris, France

Filed Jul. 16, 1987, Ser. No. 74,024
Claims priority, application France, Jul. 16, 1986, 86 10329
Int. Cl.[4] C03B 23/02
U.S. Cl. 65—106 8 Claims



1. A process for bending plates of thermoplastic material into a convex shape, comprising:

advancing said plates into a bending chamber, on a support means comprising a roller conveyor,

supporting 10–80% of the weight of said plates while on said support means by way of a gas stream blown from below said support means,

centering said glass plates with respect to their placement in the direction perpendicular to the advance of said glass plate, while said plates are so supported, and

applying said plates against an upper mold.

6. Apparatus for bending glass plates, comprising a convexing installation having an upper convexing mold against which glass plates are intended to be applied, a support means comprising a roller conveyor for advancing said glass plates into a position below said upper convexing mold, a pressurized gas tank having an upper baffle equipped with a multiple number of outlets said outlets loated under the support means, said gas tank intended to blow a stream of gas in an ascending vertical direction in order to take up a part of the weight of the glass, and also comprising means for centering the glass plates with respect to their placement in the direction perpendicular to the advance of said glass plates, said centering taking place while the ascending stream of gas is working.

4,802,905

METHOD FOR PROTECTING PLANTS AND PLANT MATTER FROM STRESS

Marshall Spector, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 10, 1987, Ser. No. 24,273
Int. Cl.[4] A01N 3/02, 33/04
U.S. Cl. 71—68 9 Claims

1. In a process for protecting a plant from damage due to stress, wherein a polyamine or polyamine salt is applied to such plant in an amount effective for protecting such plant from stress, the improvement which comprises utilizing a polyamine represented by the formula $H_2NCHRCHR(—NHCHR-CHR—)_nNH_2$ where n represents an integer of from 1 to 3 and R represents either hydrogen or a methyl group or a salt of such polyamine.

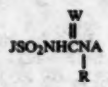
4,802,906

HERBICIDAL ORTHO-SULFONAMIDE BENZENESULFONYLUREAS

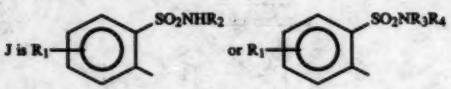
Donald J. Dumas, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 703,669, Feb. 21, 1985, abandoned. This application Dec. 23, 1985, Ser. No. 810,336
Int. Cl.[4] A01N 43/54; C07D 239/69, 239/84, 401/12
U.S. Cl. 71—92 33 Claims

1. A compound of the formula



and agriculturally suitable salts thereof, wherein:



J-1 J-2

W is O or S;

R is H or CH_3;

R_1 is H, C_1 to C_3 alkyl, C_1 to C_3 haloalkyl, halogen, nitro, C_1 to C_3 alkoxy, $SO_2NR_eR_f$, C_1 to C_3 alkylthio, C_1 to C_3 alkylsulfinyl, C_1 to C_3 alkylsulfonyl, CN, CO_2R_c, C_1 to C_3 haloalkoxy, C_1 to C_3 haloalkylthio, C_2 to C_3 alkoxyalkyl, C_2 to C_3 haloalkoxyalkyl, C_2 to C_3 alkylthioalkyl, C_2 to C_3 haloalkylthioalkyl, C_2 to C_3 cyanoalkyl or NR_eR_c;

R_e is H, C_1 to C_4 alkyl, C_2 to C_3 cyanoalkyl, methoxy or ethoxy;

R_f is H, C_1 to C_4 alkyl or C_3 to C_4 alkenyl; or

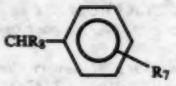
R_e and R_f can be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;

R_c is C_1 to C_4 alkyl, C_3 to C_4 alkenyl, C_3 to C_4 alkynyl, C_2 to C_4 haloalkyl, C_2 to C_3 cyanoalkyl, C_5 to C_6 cycloalkyl, C_4 to C_7 cycloalkylalkyl or C_2 to C_4 alkoxyalkyl;

R_d and R_e are independently H or C_1 to C_2 alkyl;

R_2 is C_2 to C_6 haloalkenyl, C_3 to C_6 cycloalkyl, C_3 to C_6 cycloalkyl optionally substituted with 1 or 2 CH_3 groups, C_4 to C_7 cycloalkylalkyl, C_3 to C_6 cycloalkenyl, C_3 to C_6 epoxyalkyl, C_2 to C_6 haloalkyl, $CH_2CH_2(OR_5)_2$,

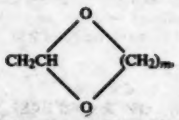
phenyl which may be optionally substituted with R_7,



$CH_2C(O)CH_3$, CN, C_1 to C_6 alkyl substituted with OR_9, $S(O)_nR_{10}$ or $NR_{11}R_{12}$, Q, CHR_8Q or CH_2CH_2Q;

R_3 is C_1 to C_6 alkyl, C_3 to C_6 alkenyl, C_3 to C_6 alkynyl, C_3 to C_6 cycloalkyl which can be optionally substituted with 1 or 2 CH_3 groups, C_4 to C_7 cycloalkylalkyl, C_5 to C_6 cycloalkenyl, C_1 to C_5 alkoxy, C_3 to C_6 epoxyalkyl or C_1 to C_6 alkyl substituted with OR_9, $S(O)_nR_{10}$, $NR_{11}R_{12}$ or $P(O)(OR_5)_2$;

R_4 is $CH_2CH_2(OR_5)_2$,



C_2 to C_6 haloalkenyl, C_3 to C_6 epoxyalkyl, $CH_2C(O)CH_3$, CN, C_1 to C_6 alkyl substituted with OR_9, $S(O)_nR_{10}$ or $NR_{11}R_{12}$, Q, CHR_8Q or CH_2CH_2Q;

R_5 is C_1 to C_3 alkyl;

R_7 is H, C_1 to C_3 alkyl, halogen, NO_2, CF_3, CN or C_1 to C_3 alkoxy;

R_8 is H or CH_3;

R_9 is H, SO_2R_5, $C(O)R_5$, CO_2R_5, $C(O)NR_{11}R_{12}$ or $P(O)(OR_5)_2$;

R_{10} is C_1 to C_3 alkyl;

R_{11} is H or C_1 to C_3 alkyl;

R_{12} is H or C_1 to C_3 alkyl;

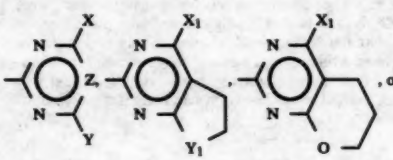
m is 2 or 3;

n is 0, 1 or 2;

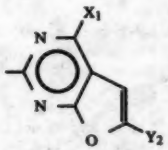
Q is a heterocycle selected from the group: pyrrolidine, pyrrole, dithiolane, tetrahydrofuran, dioxane, thiazole, thiadiazole, pyrimidine, and pyridine optionally substituted by one or more groups selected from L;

L is C_1 to C_3 haloalkyl, halogen, C_1 to C_3 alkoxy, C_1 to C_3 alkylthio, C_3 to C_4 alkenyloxy, C_3 to C_4 alkenylthio, C_1 to C_2 haloalkoxy or C_1 to C_2 haloalkylthio;

A is



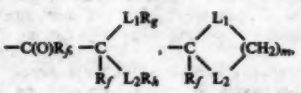
A-1 A-2 A-3



A-4

X is H, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, C_1 to C_4 haloalkoxy, C_1 to C_4 haloalkyl, C_1 to C_4 haloalkylthio, C_1 to C_4 alkylthio, halogen, C_2 to C_5 alkoxyalkyl, C_2 to C_5 alkoxyalkoxy, amino, C_1 to C_3 alkylamino or di(C_1 to C_3 alkyl)amino;

Y is H, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, C_1 to C_4 haloalkoxy, C_1 to C_4 haloalkylthio, C_1 to C_4 alkylthio, C_2 to C_5 alkoxyalkyl, C_2 to C_5 alkoxyalkoxy, amino, C_1 to C_3 alkylamino, di(C_1 to C_3 alkyl)amino, C_3 to C_4 alkenyloxy, C_3 to C_4 alkynyloxy, C_2 to C_5 alkylthioalkyl, C_1 to C_4 haloalkyl, C_3 to C_5 cycloalkyl, C_2 to C_4 alkynyl,



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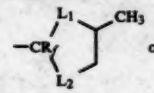


or $N(OCH_3)CH_3$;

L_1 and L_2 are independently O or S;
R_f is H or CH_3;
R_g and R_h are independently C_1 to C_2 alkyl;
Z is CH;
Y_1 is O;
X_1 is CH_3, OCH_3, OC_2H_5 or OCF_2H;
Y_2 is H or CH_3;
provided that:

(a) when X is Cl, F, Br or I, then Y is OCH_3, OC_2H_5, $N(OCH_3)CH_3$, $NHCH_3$, or $N(CH_3)_2$; and

(b) when R_2 is CH_2CF_3 and A is A-1 then one or both of X and Y is OCF_2H.

23. A method for the control of undesirable vegetation comprising applying to the locus of such vegetation an herbicidally effective amount of a compound of claim 1.

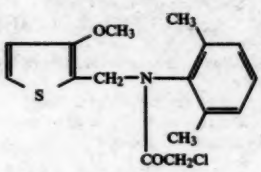
4,802,907

N-SUBSTITUTED CHLOROACETANILIDES PROCESSES FOR PRODUCTION THEREOF, AND HERBICIDAL COMPOSITION COMPRISING THE SAME

Tetsuo Takematsu, Utsunomiya; Shozo Kato, Fujisawa; Masahiko Ishizaki, Sagamihara, and Toshihisa Suyama, Chigasaki, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Continuation of Ser. No. 622,649, Jun. 20, 1984, abandoned. This application Sep. 4, 1987, Ser. No. 94,092
Claims priority, application Japan, Jun. 22, 1983, 58-111011
Int. Cl.[4] A01N *43/02*; C07D *333/32*
U.S. Cl. 71—90 **4 Claims**

1. A herbicidal composition comprising a herbicidally effective amount of an N-substituted chloroacetanilide represented by the following formula



and a herbicidally acceptable diluent or carrier.

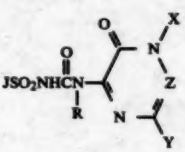
4,802,908

HERBICIDAL 2-(1H)-PYRAZINONES

Craig L. Hillemann, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

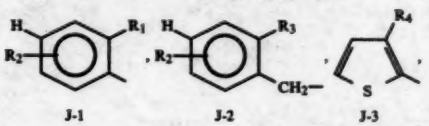
Filed Jan. 22, 1987, Ser. No. 6,822
Int. Cl.[4] A01N *9/16*; C07D *401/12*, *403/12*
U.S. Cl. 71—70 **35 Claims**

1. A compound of the formula:

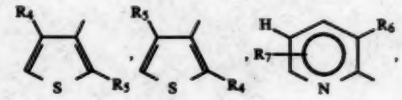


I

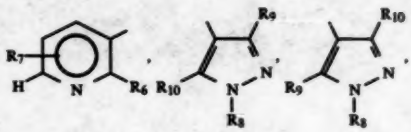
wherein
R is H or CH_3;
X is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, NH_2, $NHCH_3$ or $N(CH_3)_2$;
Y is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_2 alkylthio, Cl or Br;
Z is CH, CF, CCl or CBr;
J is



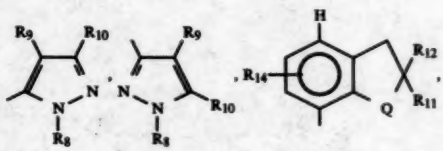
J-1 J-2 J-3



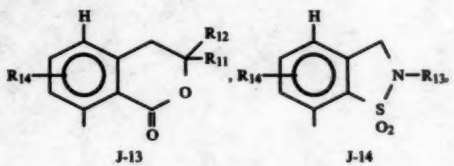
J-4 J-5 J-6



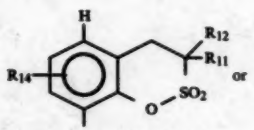
J-7 J-8 J-9



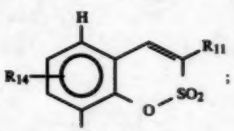
J-10 J-11 J-12



J-13 J-14



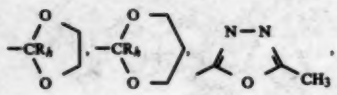
J-15



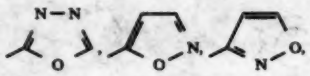
J-16

R_1 is F, Cl, Br, NO_2, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_3–C_4 cycloalkyl, C_2–C_4 haloalkenyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_2–C_4 alkoxyalkoxy, CO_2R_e, $C(O)NR_fR_c$, $SO_2NR_fR_c$, $S(O)_nR_f$, $C(O)R_g$, CH_2CN or L;
R_2 is H, F, Cl, Br, CN, CH_3, OCH_3, SCH_3 or OCF_2H;
R_3 is Cl, NO_2, CO_2CH_3, $CO_2CH_2CH_3$, $SO_2N(CH_3)_2$, SO_2CH_3, $SO_2CH_2CH_3$, OCH_3 or OCH_2CH_3;
R_e is C_1–C_3 alkyl optionally substituted by halogen, C_1–C_2 alkoxy or CN, allyl or propargyl;
R_4 is H, C_1–C_3 alkyl or C_1–C_2 alkoxy;

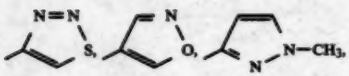
R_c is C_1–C_2 alkyl;
R_d is H, C_1–C_3 alkyl, C_1–C_2 alkoxy, allyl or cyclopropyl;
R_e is H or C_1–C_3 alkyl;
R_f is C_1–C_3 alkyl, C_1–C_3 haloalkyl, allyl or propargyl;
R_g is C_1–C_4 alkyl, C_1–C_4 haloalkyl or C_3–C_5 cycloalkyl optionally substituted by halogen;
n is 0, 1 or 2;
L is



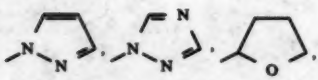
L-1 L-2 L-3



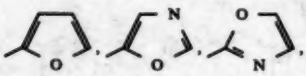
L-4 L-5 L-6



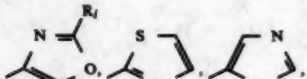
L-7 L-8 L-9



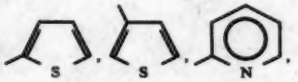
L-10 L-11 L-12



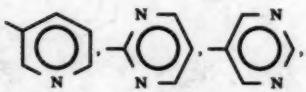
L-13 L-14 L-15



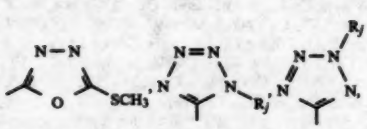
L-16 L-17 L-18



L-19 L-20 L-21



L-22 L-23 L-24



L-25 L-26 L-27

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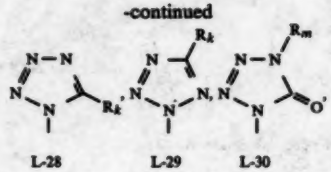
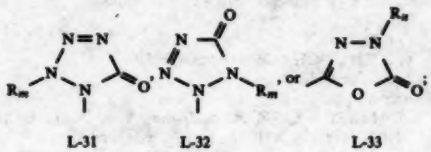


L-28 L-29 L-30



L-31 L-32 L-33

R_4 is H or CH_3;
R_f is H or CH_3;
R_j is H, CH_3 or CH_2CH_3;
R_k is H, CH_3, CH_2CH_3, OCH_3, OCH_2CH_3, SCH_3 or SCH_2CH_3;
R_m is H, CH_3 or CH_2CH_3;
R_n is H or CH_3;
R_4 is C_1–C_3 alkyl, C_1–C_2 haloalkyl, C_1–C_2 alkoxy, C_2–C_4 haloalkenyl, F, Cl, Br, NO_2, CO_2R_c, $C(O)NR_dR_e$, $SO_2NR_dR_e$, $S(O)_nR_f$, $C(O)R_g$ or L;
R_5 is H, F, Cl, Br or CH_3;
R_6 is C_1–C_3 alkyl, C_1–C_2 alkoxy, C_2–C_4 haloalkenyl, F, Cl, Br, CO_2R_c, $C(O)NR_dR_e$, $SO_2NR_dR_e$, $S(O)_nR_f$, $C(O)R_g$ or L;
R_7 is H, F, Cl or CH_3;
R_8 is H or C_1–C_3 alkyl;
R_9 is C_1–C_3 alkyl, C_1–C_2 alkoxy, F, Cl, Br, NO_2, CO_2R_c, $SO_2NR_dR_e$, $S(O)_nR_f$, OCF_2H, $C(O)R_g$, C_2–C_4 haloalkenyl or L;
R_{10} is H, Cl, F, Br, C_1–C_3 alkyl or C_1–C_2 alkoxy;
R_{11} is H or C_1–C_2 alkyl;
R_{12} is H or C_1–C_2 alkyl;
R_{13} is H, C_1–C_6 alkyl, C_1–C_4 haloalkyl, C_2–C_4 alkoxyalkyl, C_3–C_5 cycloalkyl or C_4–C_6 cycloalkylalkyl;
R_{14} is H, F, Cl, Br, CN, CH_3, OCH_3, SCH_3 or OCF_2H; and
Q is O, S, SO, SO_2 or C(O);
and their agriculturally suitable salts; provided that X and Y are not simultaneously H.

29. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

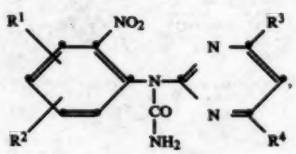
4,802,909

UREAS AND THEIR USE AS HERBICIDES

Hermann Rempfler, Ettingen; Erich Stamm, Huttwil, and Rudolph C. Thummel, Courgenay, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 9, 1987, Ser. No. 107,437
Claims priority, application Switzerland, Oct. 13, 1986, 4074/86; Jul. 28, 1987, 2869/87
Int. Cl.[4] A01N *43/54*; C07D *239/42*
U.S. Cl. 71—92 14 Claims

1. Compounds of the formula



(I)

in which
R^1 and R^2 each represents, independently of the other, hy-

drogen, halogen, C_1–C_6-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkoxy-(C_1–C_4)-alkyl, nitro or cyano, and

R^3 and R^4 each represents, independently of the other, hydrogen, halogen, cyano, OH, SH, C_1–C_6-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio, amino, mono-C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkoxy-(C_1–C_4)-alkyl,

and the salts and addition compounds thereof with acids, bases and complex formers.

12. A method of controlling undesired plant growth, characterised in that a herbicidally effective amount of an active ingredient of the formula I according to claim 1 is applied to the environment of the plant to be controlled.

4,802,910

HERBICIDAL ACYLATED SULPHONYLGUANIDINES

Rolf Kirsten, Monheim; Joachim Kluth, Langenfeld; Klaus-Helmut Müller, Düsseldorf; Theodor Pfister, Monheim; Hans-Jochem Riebel, Wuppertal; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

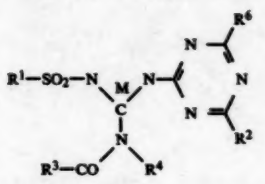
Filed Jan. 20, 1987, Ser. No. 5,539

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1986, 3602679

Int. Cl.[4] A01N *43/66*; **C07D** *251/46, 251/52, 251/18*

U.S. Cl. 71—93 **10 Claims**

1. An acylated sulphonylguanidine of the formula



in which

R^1 represents an optionally substituted radical from the group consisting of alkyl, aralkyl and aryl with in each case up to 10 carbon atoms,

R^2 represents hydrogen, halogen, hydroxyl, C_1–C_4-alkyl, C_1–C_4-halogenoalkyl, C_1–C_4-alkoxy, C_1–C_4-halogenoalkoxy, C_1–C_4-alkylthio, C_1–C_4-halogenoalkylthio, amino, C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)-amino,

R^5 represents hydrogen, halogen, cyano, C_1–C_4-alkyl, formyl, C_1–C_4-alkyl-carbonyl or C_1–C_4-alkoxy-carbonyl,

R^6 represents hydrogen, halogen, hydroxyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)-amino,

R^3 represents a radical R^7, or represents a radical —NHR^8,

R^7 represents an optionally substituted radical from the group consisting of alkyl, alkenyl, alkinyl, alkoxy, alkenyloxy, alkinyloxy, cycloalkyl, dialkylamino, aralkyl, aryl, aralkoxy, aryloxy, alkylthio, aralkylthio and arylthio with in each case up to 10 carbon atoms,

R^8 represents an optionally substituted radical from the group consisting of alkyl, cycloalkyl, aralkyl, aryl and arylsulphonyl with in each case up to 10 carbon atoms,

R^4 represents hydrogen, or represents an optionally substituted radical from the group consisting of alkyl, alkenyl, alkinyl, cycloalkyl, aralkyl and aryl with in each case up to 10 carbon atoms, or

R^4 represents the radical —OR^9 or —$NR^{10}R^{11}$,

R^9 represents hydrogen or an optionally substituted radical from the group consisting of alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkylalkyl, aralkyl and aryl with in each case up to 10 carbon atoms,

R^{10} represents hydrogen or C_1–C_4-alkyl,

R^{11} represents hydrogen or an optionally substituted radical from the group consisting of alkyl, alkenyl, alkinyl, cycloalkyl, aralkyl, aryl, alkylcarbonyl, alkoxycarbonyl, alkylsulphonyl and arylsulphonyl with in each case up to 10 carbon atoms, and

M represents hydrogen or one equivalent of a metal or represents the radical —COR^7, the optional substituents when present being selected from the group consisting of fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkoxycarbonyl, di-(C_1–C_4-alkyl)-amino-carbonyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl and C_1–C_4-alkylsulphonyl,

or a strong acid adduct thereof.

9. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound or adduct according to claim 1.

4,802,911

PHENYL-SUBSTITUTED SULFONAMIDES

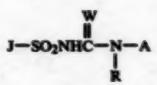
Robert J. Pasteris, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 705,833, Mar. 1, 1985, which is a continuation-in-part of Ser. No. 607,990, May 7, 1984, abandoned. This application Jun. 17, 1987, Ser. No. 63,218

Int. Cl.[4] A01N *43/54, 43/72*; **C07D** *239/42, 417/12*

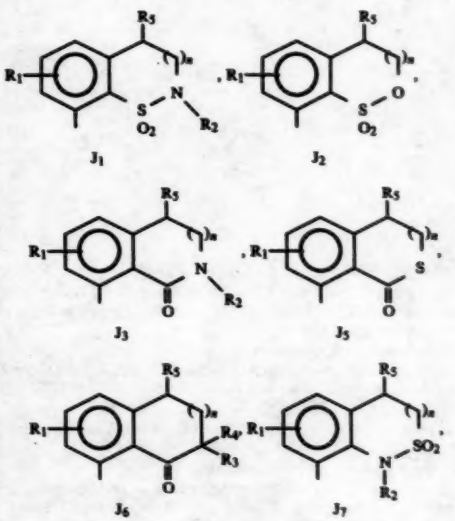
U.S. Cl. 71—92 **27 Claims**

1. A compound of the formula:



wherein

J is



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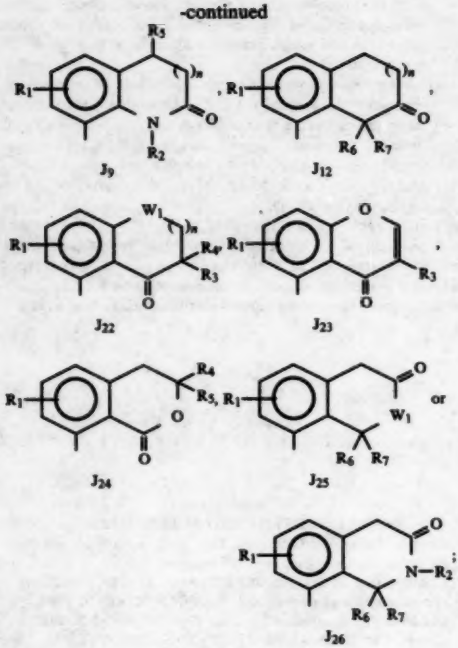
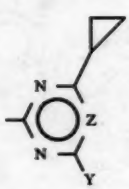


n is 0, 1 or 2;
W is O or S;
W_1 is O or S;
R is H or CH_3;
R_1 is H, F, Cl, Br, CH_3, OCH_3, CF_3, SCH_3 or OCF_2H;
R_2 is H or C_1–C_4 alkyl;
R_3 and R_4 are independently H, C_1–C_4 alkyl, Cl or Br;
R_5 is H or CH_3;
R_6 is H or CH_3;
R_7 is H or CH_3;
A is



Y is
CH_3, CH_2CH_3, OCH_3, OCH_2CH_3, CH_2OCH_3, OCF_2H, SCF_2H, OCH_2CF_3, CF_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $NHCH_3$, $N(CH_3)_2$ or $CH(OCH_3)_2$; and
Z is CH provided that
(a) when W is S, then R is H;
(b) the total number of carbon atoms in R_3 and R_4 is less than or equal to 4;
(c) when R_5 is CH_3, then n is 0; and
(d) when J is J_{24}, then R_4 and R_5 are not both H and R_4 is not Cl or Br;
and their agriculturally suitable salts.

23. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,802,912

HERBICIDE ANTIDOTES

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Co., Westport, Conn.

Continuation-in-part of Ser. No. 291,207, Aug. 10, 1981, abandoned. This application Dec. 27, 1983, Ser. No. 566,009
Int. Cl.[4] A01N *2/32*
U.S. Cl. 71—100 10 Claims

1. A compound having the formula

$$CH_2Br{-}CHBr{-}CH_2{-}O{-}S{-}R_1$$

wherein R_1 is trihaloalkyl having 1 to 4 carbon atoms, inclusive.

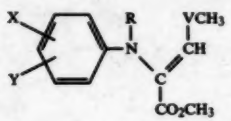
4,802,913

FUNGICIDAL ALPHA-SUBSTITUTED ACRYLATES

John Clough, Marlow, and Christopher R. A. Godfrey, Bracknell, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 5, 1986, Ser. No. 893,272
Claims priority, application United Kingdom, Aug. 22, 1985, 8521082
Int. Cl.[4] A01N *37/10*; C07C *69/618*
U.S. Cl. 71—111 5 Claims

1. A compound having the general formula:



and stereoisomers thereof, wherein V is oxygen or sulphur; R is hydrogen or lower alkyl; X is hydrogen, C_{1-4} alkyl, C_{3-4} alkenyl, halogen, phenyl, naphthyl, pyridyl, pyrimidinyl, benzyl, phenoxy, benzyloxy, pyridyloxy, furyl, thienyl, benzothienyl or pyrrolyl, each aryl or heteroaryl moiety being optionally substituted with one or more of halogen, C_{1-4} alkyl, C_{1-4} alkoxy or halo C_{1-4} alkyl; and Y is hydrogen or halogen.

5. A fungicidal, or plant growth regulating composition comprising, as an active ingredient, a compound as claimed in claim 1 together with a carrier therefor.

4,802,914

PROCESS FOR AGGLOMERATING MINERAL ORE CONCENTRATE UTILIZING DISPERSIONS OF POLYMER BINDERS OR DRY POLYMER BINDERS

Meyer R. Rosen, Parsippany; Lawrence Marlin, Bridgewater, and Anthony C. Bracco, Howell, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 736,237, May 21, 1985. This application Sep. 5, 1986, Ser. No. 903,968
Int. Cl.[4] C22B *1/08*
U.S. Cl. 75—3 63 Claims

1. A process of agglomerating a particulate material consisting essentially commingling said particulate material with a binding amount of water soluble polymer, wherein said polymer is applied to said particulate material as a dispersion in a non-aqueous dispersion medium.

4,802,915

PROCESS FOR PRODUCING FINELY DIVIDED SPHERICAL METAL POWDERS CONTAINING AN IRON GROUP METAL AND A READILY OXIDIZABLE METAL

Nelson E. Kopatz, Sayre; Joseph E. Ritsko, and Walter A. Johnson, both of Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 25, 1988, Ser. No. 185,713
Int. Cl.[4] B22F 9/24
U.S. Cl. 75—0.5 AA 16 Claims

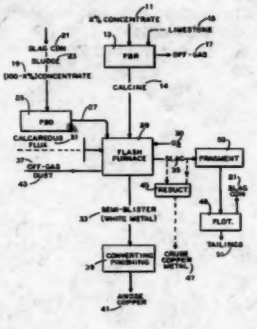
1. A process comprising:
(a) forming an aqueous solution containing at least one metal from the iron group metal,
(b) forming from said solution a reducible solid material selected from salts of said iron group metal, oxides of said iron group metal, hydroxides of said iron group metal and mixtures thereof,
(c) reducing said material to form metallic powder particles,
(d) entraining at least a portion of said powder particle in a carrier gas,
(e) feeding said entrained particles and said carrier gas into a high temperature zone and maintaining said particles in said zone for a sufficient time to melt at least about 50% by weight of said particles, and to form droplets therefrom and
(f) cooling said droplets to form metal particles having essentially a spherical shape,
(g) combining said spherical shaped particles with finely divided particles of at least one easily oxidizable metal in a non-oxidizing atmosphere to form an agglomerate and,
(h) subjecting said agglomerates to a sufficient temperature in a non-oxidizing atmosphere to form an alloy.

4,802,916

COPPER SMELTING COMBINED WITH SLAG CLEANING

Grigori S. Victorovich, Toronto; Carlos M. Diaz; Charles E. O'Neill, both of Mississauga; James A. E. Bell, Oakville, and Lloyd M. Timberg, Burlington, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed Feb. 7, 1986, Ser. No. 827,086
Claims priority, application Canada, Mar. 20, 1985, 476986
Int. Cl.[4] C22B 15/00
U.S. Cl. 75—24 9 Claims



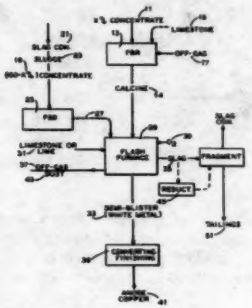
1. A process of oxidizing sulfidic copper ore concentrate containing iron and having a high iron to silica weight ratio to a copper metal product containing substantially no iron comprising charging to and autogenously combusting said sulfidic copper material containing iron in a bounded space with an oxygen-containing gas in the presence of a coolant at least part of which is a roasted copper concentrate and a calcareous flux to thereby provide a copper oxide-containing slag based upon the components CaO, FeO and Fe_2O_3 containing essentially all the iron and silica charged to said bounded space, a molten copper metal containing a small amount of white metal and an off-gas containing sulfur dioxide and thereafter cleaning said slag to recover metallic copper directly by said cleaning.

4,802,917

COPPER SMELTING WITH CALCAREOUS FLUX

Grigori S. Victorovich, Toronto; Carlos M. Diaz, and Charles E. O'Neill, both of Mississauga, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed Feb. 7, 1986, Ser. No. 827,085
Claims priority, application Canada, Mar. 20, 1985, 476987
Int. Cl.[4] C22B 15/00
U.S. Cl. 75—26 5 Claims



1. A process for the production of an iron-free, copper metallic copper product at least as rich in copper as semi-blister copper comprising charging a calcareous flux and an iron containing sulfidic ore concentrate from the group consisting of chalcopyrite concentrate and bornite concentrate having a high iron to silica ratio into a bounded space and autogenously combusting said sulfidic ore concentrate therein with an oxygen-containing gas in the presence of a coolant to thereby privide a slag based upon the components CaO, FeO and Fe_2O_3 containing essentially all the iron and silica of the charged materials, a molten copper metal and an off-gas containing sulfur dioxide.

4,802,918

CASE HARDENED STEEL AND METHOD OF MANUFACTURING THE SAME

Takao Ooki, Chita, and Jun Eguchi, Nagoya, both of Japan, assignors to Aichi Steel Works, Limited, Tokai, Japan

PCT No. PCT/JP86/00434, § 371 Date Apr. 3, 1987, § 102(e) Date Apr. 3, 1987, PCT Pub. No. WO87/01396, PCT Pub. Date Mar. 12, 1987
PCT Filed Aug. 22, 1986, Ser. No. 50,290
Claims priority, application Japan, Sep. 2, 1985, 60-193661
Int. Cl.[4] C22B 4/00
U.S. Cl. 75—10.61 4 Claims

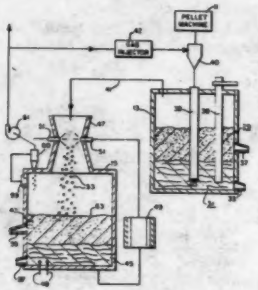
1. A case hardened steel consisting essentially of, by weight, 0.10–0.30% of carbon, not more than 0.50% of silicon, not more than 1.50% of manganese, not more than 0.012% of phosphorus, not more than 0.009% of sulfur, 0.020–0.040% of aluminum, not more than 0.0010% of oxygen, 0.0100–0.0200% of nitrogen and a member of members selected from the group consisting of 0.20–1.50% of chromium, 0.10–0.35% of molybdenum and 0.20–3.0% of nickel, the remainder being iron and inevitable impurities, said steel having a high reduction of area or more than 84% in warm forging and rated rolling fatigue strength B_{10} of $4.1–10.5\times10^7$ and an average rolling fatigue strength B_{50} of $9.7–24.6\times10^7$ after carburizing followed by quenching and tempering.

4,802,919

METHOD FOR PROCESSING OXIDIC MATERIALS IN METALLURGICAL WASTE

Maurice G. Fey, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 6, 1987, Ser. No. 69,570
Int. Cl.[4] C21B 3/04; C22B 7/02
U.S. Cl. 75—25 13 Claims



1. A method for processing metallurgical waste from a ferrous metallurgical furnace comprising the steps of:

(a) collecting metallurgical dust containing oxides of metals which when reduced, form volatile and non-volatile metals;

(b) providing a reducing furnace containing a first metal bath and a reacting slag on the metal bath;

(c) heating in the reducing slag a mixture of the metallurgical dust and a carbonaceous material which react to form a vapor of volatile metal and non-volatile elemental metal;

(d) venting the volatile metal from the furnace; and

(e) directing the volatile metal through an inlet into a condenser for condensing the volatile metal into a second liquid metal bath.

9. A method of recovering lead and zinc from metallurgical waste from ferrous metallurgical furnace, comprising the steps of:

(a) collecting metallurgical dust containing oxides of metals which when reduced, form volatile elemental metal;

(b) compacting without heating a mixture of the dust, carbonaceous material, and silica into pellets;

(c) providing a reducing furnace containing a metal bath and a reacting slag;

(d) introducing the pellets into the reacting slag to reduce the dust into vapors of volatile metals and nonvolatile elemental metals with the nonvolatile elemental metal sinking from the slag into the metal bath;

(e) venting the vapors of the volatile metals from the furnace;

(f) directing the vapors through an inlet into a condenser for condensing the volatile metals into a liquid metal melt; and

(g) circulating the liquid metal melt to a location near said inlet and above the melt and spraying droplets of said melt into the vapor of volatile metal to cause the volatile metal vapor to condense on the surfaces of the droplets.

4,802,920

EXTRACTION OF METALS FROM AQUEOUS SOLUTIONS WITH ASPHALTENES

Simon G. Kukes, and Clifford E. Smith, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 18, 1985, Ser. No. 810,464
Int. Cl.[4] C22B 11/04
U.S. Cl. 75—118 R 47 Claims

1. A process for extracting at least one metal selected from the group consisting of gold, silver and combinations thereof from an aqueous solution containing said at least one metal, comprising:

(a) contacting said aqueous solution with an asphaltene to extract said at least one metal from said aqueous solution to said asphaltene; and

(b) recovering said thus extracted at least one metal from said asphaltene.

4,802,921

REFRACTORY COATING COMPOSITION

Hideo Motoki, Ibaraki, Japan, assignor to Minoru Fujii, Osaka, Japan

Continuation-in-part of Ser. No. 454,651, Dec. 30, 1982, abandoned. This application Sep. 14, 1984, Ser. No. 650,579
Claims priority, application Japan, Dec. 31, 1981, 56-213081
Int. Cl.[4] C09D 5/18, 1/02
U.S. Cl. 106—18.12 6 Claims

1. Refractory coating compositions comprising as the active components:

(A) 100 parts by weight of a water-soluble alkali metal silicate,

(B) 3 to 250 parts by weight of a hardening agent for the alkali metal silicate, and

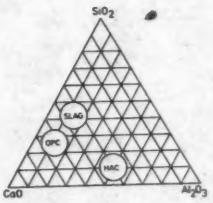
(C) 100 to 600 parts by weight of a material, having an ability to release more than 15% by weight of the water contained therein when heated to 600° C., based on 100% by weight of the material at 100° C.

4,802,922

CAPSULES OF HIGH ALUMINA CEMENT COMPOSITIONS

Roderick M. Smart, Birmingham, United Kingdom, assignor to Fosroc International Limited, Birmingham, England

Filed Apr. 3, 1987, Ser. No. 34,526
Claims priority, application United Kingdom, Nov. 4, 1986, 8608715; Nov. 4, 1986, 8608716
Int. Cl.[4] C04B 7/19
U.S. Cl. 106—89 14 Claims



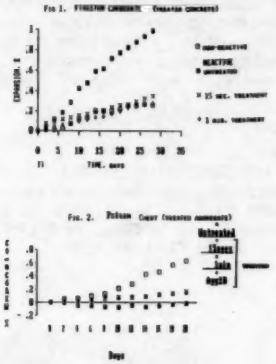
1. A frangible capsule containing in separate compartments the interactive components of a self-setting cementitious composition, one component being a base component and comprising high alumina cement, retarders, a reactive filler and water, and the other component being a catalyst component and comprising lime and water, wherein the fillers of the base component includes both CaO and SiO_2 in sufficient quantity such that when the interactive components are interacted the hydrate phases of a hydrated Portland cement are formed.

4,802,923

BENEFACTION OF CONCRETE AND AGGREGATE USING CALCIUM PHOSPHATE

Peter Hudec, 5755, Dalton Avenue, Windsor, Ontario, Canada (N1H 1M9)

Filed Jul. 14, 1987, Ser. No. 73,198
Claims priority, application Canada, Jul. 17, 1986, 514050
Int. Cl.[4] C04B *14/00*
U.S. Cl. 106—97 12 Claims



11. A wet concrete mixture adapted to prevent physical deterioration due to de-icing salt in pores and alkali reactivity of concrete produced with said wet mixture, and to increase its strength, said wet concrete comprising cement, aggregates, and water containing a solubilized calcium phosphate additive.

4,802,924

COATINGS BASED ON POLYDEXTROSE FOR AQUEOUS FILM COATING OF PHARMACEUTICAL FOOD AND CONFECTIONARY PRODUCTS

Edward J. Woznicki, Douglassville, and Susan M. Grillo, Telford, both of Pa., assignors to Colorcon, Inc., West Point, Pa.

Filed Jun. 19, 1986, Ser. No. 876,186
Int. Cl.[4] A61K *9/00*
U.S. Cl. 427—3 32 Claims

1. A method of film coating pharmaceutical tablets, food, confectionery forms and the like with a protective film coating comprising the steps of

mixing polydextrose, plasticizer, detackifier, and secondary film former into water to form an aqueous coating suspension,

spraying an effective amount of said coating suspension onto said tablets to form a film coating on said tablets,

and drying the film coating on said tablets,

wherein the amount of polydextrose used is sufficient to yield improved results as compared to a similar coating absent polydextrose.

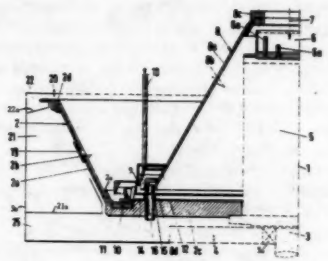
4,802,925

CONTINUOUSLY OPERABLE CENTRIFUGE FOR MASHING AND CENTRIFUGING OF SUGAR MASSECUITE

Helmut Schaper, Brunswick, and Heinrich Kurland, Erkerode-Lucklum, both of Fed. Rep. of Germany, assignors to Braunschweigische Maschinenbauanstalt AG, Brunswick, Fed. Rep. of Germany

Continuation of Ser. No. 2,955, Jan. 13, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 183,290
Claims priority, application European Pat. Off., Jan. 18, 1986, 86710003.4
Int. Cl.[4] C13F *1/00*; B01D *33/00*
U.S. Cl. 127—19 6 Claims

1. A continuously operable centrifuge for mashing and centrifuging of sugar massecuite, comprising a vertical axis (1), a hub (5) rotatable about said vertical axis, a screen drum (2) and means mounting said screen drum to said hub for rotation about said vertical axis, said screen drum opening conically in an upward direction, said hub (5) reaching upwardly into the interior of said screen drum, massecuite filling and distributing means (6) mounted on top of said hub, downwardly opening conical precentrifuging acceleration bell means (8) mounted for rotation with said hub and reaching downwardly toward a bottom zone of said screen drum, said precentrifuging acceleration bell means (8) comprising a solid wall (8*a*) having an upper inlet end and a lower open discharge end, and a screen (8*b*) supported on said solid wall with a spacing between said solid wall and said screen (8*b*), a ring space (15) surrounding said lower discharge end of said solid wall (8*a*) for receiving liquid green run-off in said ring space (15), liquid discharge passages leading into said ring space for removing said green run-off, said precentrifuging acceleration bell means further comprising at its lower open discharge end a discharge rim (17) for discharging a precentrifuged crystalline mass, mashing means comprising a mashing ring (9) surrounding said discharge rim (17) with a radial spacing, said mashing ring (9) having a lower rim (9*a*) reaching close to a bottom of said



screen drum (2), stationary mashing liquid supply means (14) having mashing liquid discharge openings extending to a level above said discharge rim (17) for supplying mashing liquid onto said mashing ring (9), said acceleration bell means having an opening angle larger than that of said screen drum (2), means mounting said mashing ring (9) for rotation with said hub, said mashing ring opening downwardly with a conical slope which is steeper than that of said screen drum and steeper than that of said precentrifuging acceleration bell means, and wherein said mashing liquid discharge openings of said stationary mashing liquid supply means (14) face in a direction toward a radially inner surface of said mashing ring (9) at a level above a zone on which said precentrifuged crystalline mass from said discharge rim (17) impinges on said mashing ring (9).

4,802,926

SPRAY DRIED LACTOSE AND PROCESS FOR PREPARING THE SAME

Klaas D. Kussendrager; Henricus A. M. van den Biggelaar, both of Veghel, and Herman Vromans, Een, all of Netherlands, assignors to DMV-Campina B.V., GE Veghel, Netherlands

Filed Mar. 18, 1987, Ser. No. 27,424
Claims priority, application Netherlands, Mar. 21, 1986, 8600731
Int. Cl.[4] C13K *5/00*
U.S. Cl. 127—31 2 Claims

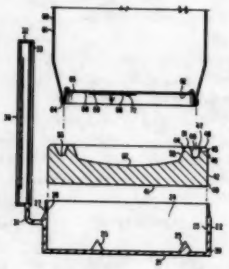
1. Spray dried lactose products obtained by feeding a slurry of crystalline alpha-lactose hydrate in a saturated lactose solution to a spray dryer and drying the same, characterized in that from about 15 to about 50% by weight of the spray dried lactose is in amorphous form and at least 50% by weight of the lactose is in crystalline form, the crystalline particle size being less than about 45 micrometers.

4,802,927

BEVERAGE CAN CLEANER

Gary W. Barbour, 2108 E. St., Box 64, Chalmers, Ind. 47929

Filed May 20, 1987, Ser. No. 51,616
Int. Cl.[4] B08B *1/00*
U.S. Cl. 134—6 27 Claims



21. A method for cleaning the top of a beverage can, the top having a central surface and an axially extending annular rim surrounding the surface, the method comprising the steps of:

providing a cleaning sponge having an exterior upwardly extending annular cleaning rib, an interior upwardly extending annular cleaning rib and a rim-receiving groove disposed therebetween said groove having a bottom.

grasping the cleaning sponge;

positioning the sponge adjacent the top of the beverage can with the rim of the can disposed completely within the groove of the sponge;

pressing the sponge against the container;

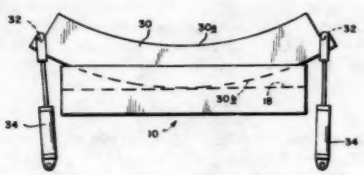
rotating the sponge relative to the can while keeping the rim of the can within the groove of the sponge.

4,802,928

DOCTORING APPARATUS AND METHOD EMPLOYING PRESTRESSED DOCTOR BLADE

Harold E. Dunlap, St. Petersburg, Fla., assignor to Thermo Electron-Web Systems, Inc., Waltham, Mass.

Filed Aug. 13, 1984, Ser. No. 640,462
Int. Cl.[4] B08B *1/02*
U.S. Cl. 134—15 10 Claims



1. In the method of doctoring a moving surface by applying the elongate front edge of a doctor blade thereto while retaining the elongate rear edge of the blade in a blade holder, the improvement comprising: preloading the doctor blade to induce tensile and compressive stresses respectively in the front and rear edges thereof, said tensile and compressive stresses being oriented in the direction of blade length and the level of said tensile stresses being sufficient to prevent compressive stresses from developing at said front edge during doctoring as a result of linear expansion caused by frictional heat.

8. For use in doctoring a moving surface, a doctor blade assembly comprising:

a blade holder having a receiving slot defined at least in part by a substantially straight seating surface;

an elongate doctor blade dimensioned for insertion into said receiving slot, said doctor blade having a projecting front edge adapted to be placed in contact with said moving surface, and a rear edge adapted to be seated against said seating surface, said front and rear edges extending along the blade length and being respectively concave and convex when said blade is loosely received in said slot; and

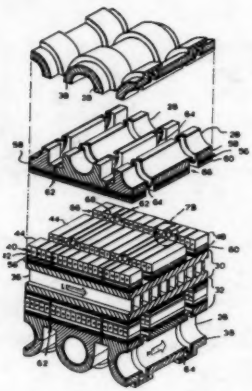
force exerting means associated with said blade holder for urging said rear edge against said seating surface in order to straighten said front and rear edges and thereby induce tensile and compressive stresses in the direction of blade length respectively in the front and rear edges of said blade.

4,802,929

COMPLIANT THERMOELECTRIC CONVERTER

Alfred Schock, Bethesda, Md., assignor to Fairchild Industries, Inc., Chantilly, Va.

Filed Dec. 19, 1986, Ser. No. 943,795
Int. Cl.[4] H01L *35/04*
U.S. Cl. 136—205 10 Claims



1. A thermoelectric converter comprising a hot surface, a plurality of thermoelectric cells bonded to said hot surface, said plurality of thermoelectric cells each having a waste heat conductor portion, a plurality of cooling pipes bonded to the waste heat conductor portions of said plurality of thermoelectric cells, and means for preventing the buildup of cumulative thermal stresses due to temperature differences and resultant thermal expansion differences between said hot surface and said cooling pipes, said means for preventing buildup of cumulative thermal stresses comprising means for accommodating differential thermal expansion in a first direction including a plurality of corrugations in said cooling pipes and means for accommodating differential thermal expansion in a second direction substantially perpendicular to said first direction including gaps located between adjacent thermoelectric cells.

4,802,930

AIR-ANNEALING METHOD FOR THE PRODUCTION OF SEAMLESS TITANIUM ALLOY TUBING

Harold D. Kessler, Sun City West, Ariz., assignor to Haynes International, Inc., Kokomo, Ind.

Filed Oct. 23, 1987, Ser. No. 111,600
Int. Cl.[4] C22F *1/18*; C22C *14/00*
U.S. Cl. 148—12.7 B 4 Claims

1. In an improved process for forming metastable beta phase titanium alloy products of the type comprising a series of at

least one intermediate cold forming step followed by an annealing step and wherein the alloy is rapidly cooled after annealing to achieve optimum physical properties wherein the improvement comprises air annealing the alloy during at least one of the series of intermediate cold forming and annealing steps.

4,802,931

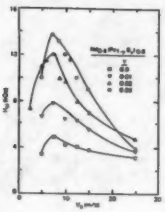
HIGH ENERGY PRODUCT RARE EARTH-IRON MAGNET ALLOYS

John J. Croat, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 508,266, Jun. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 414,936, Sep. 3, 1982. This application Oct. 26, 1983, Ser. No. 544,728

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—302 20 Claims



1. A permanent magnet in which the predominant phase is $(RE_{1-a}RE'_a)_2(Fe_{1-b}TM_b)_{14}B_1$ where RE is neodymium and/or praseodymium and comprises at least about 6 atomic percent of the magnet; RE' is one or more rare earth elements taken from the group consisting of yttrium, lanthanum, cerium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium and where a is from 0 to about 0.4 and RE and RE' together comprise up to about 40 atomic percent of the magnet; TM is one or more transition metal elements taken from the group consisting of cobalt, nickel, manganese, chromium and copper where b is from 0 to about 0.4 and Fe comprises at least about 40 atomic percent, and Fe and T, together comprise up to about 90 atomic percent of the magnet; and B comprises at least from about 0.5 to about 10 atomic percent of the magnet, the magnet having intrisic magnetic coercivity of at least 1,000 Oersteds.

4,802,932

FLUORIDE-FREE FLUX COMPOSITIONS FOR HOT GALVANIZATION IN ALUMINUM-MODIFIED ZINC BATHS

Jeannine Billiet, Oudstrijderslaan, 3 (bus 26) B-9600 Ronse, Belgium

PCT No. PCT/BE87/00003, § 371 Date Nov. 4, 1987, § 102(e) Date Nov. 4, 1987, PCT Pub. No. WO87/05337, PCT Pub. Date Sep. 11, 1987

PCT Filed Mar. 3, 1987, Ser. No. 127,293

Claims priority, application Luxembourg, Mar. 4, 1986, 86339

Int. Cl.[4] B23K *35/34*

U.S. Cl. 148—23 18 Claims

1. Fluoride free flux composition for hot galvanization using aluminium modified molten zinc baths comprising by weight:

(1) 80 to 90% of $ZnCl_2$;

(2) 10 to 20% of NH_4C; and

based on the combined weight of the $ZnCl_2$ and the NH_4Cl, further including;

(a) 0.01 to 5% of a wetting agent.

4,802,933

NICKEL-PALLADIUM BASED BRAZING ALLOYS

Anatol Rabinkin, Morris Plains, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 21, 1988, Ser. No. 184,324

Int. Cl.[4] C22C *5/04*

U.S. Cl. 148—403 9 Claims

1. An alloy having a composition represented by the formula:

$$Pd_aFe_bSi_cNi_{bal}$$

plus incidental impurities, where the subscripts "a", "b" and "c" are in atomic percent and "a" is in the range of about 38 and about 55, "b" is between about 19 and about 34.5, and "c" is in the range of about 11 to about 20.

4,802,934

SINGLE-CRYSTAL NI-BASED SUPER-HEAT-RESISTANT ALLOY

Takehiro Ohno, and Rikizo Watanabe, both of Yasugi, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Nov. 5, 1986, Ser. No. 927,109

Claims priority, application Japan, Nov. 18, 1985, 60-258078; Jun. 11, 1986, 61-135390

Int. Cl.[4] C22C *19/05*

U.S. Cl. 148—404 6 Claims

1. A single-crystal Ni-based super-heat-resistant alloy consisting essentially of, by weight percentage, 4 to 10% of Cr, 4 to 6.5% of Al, 4 to 10% of W, 4 to 9% of Ta, 2.9 to 6% of Mo, greater than impurity levels of 0.5% and not greater than 12% of Co, and the balance substantially Ni and impurities, wherein the contents of W, Ta and Mo are selected to meet the following conditions: $\frac{1}{2}$:W+$\frac{1}{2}$:Ta+Mo=9.5 to 13.5%; and at least one of Ta and W being less than 8%.

4,802,935

SUBSTRATE FOR A LITHOGRAPHIC PRINTING PLATE

Theodore J. Crona, New Martinsville, W. Va.; Heinz Bichsel, Heuhausen, Switzerland, and Jürgen Timm, Steisslingen, Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 920,205, Oct. 17, 1986, abandoned. This application Dec. 29, 1987, Ser. No. 138,932

Claims priority, application Switzerland, Oct. 30, 1985, 4668/85

Int. Cl.[4] C22C *21/00*; B41N *1/08*

U.S. Cl. 148—437 1 Claim

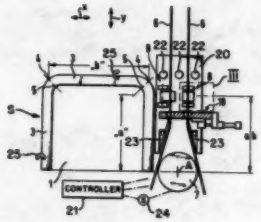
1. An aluminum substrate for a lithographic printing plate consisting essentially of 1.1 to 1.8 wt. % iron, 0.1 to 0.4 wt. % silicon, 0.25 to 0.6 wt. % manganese, up to 0.3 wt. % copper, up to 0.8 wt. % magnesium, up to 2.0 wt. % zinc, 1.0 wt. % total of other elements which each individually do not exceed 0.3 wt. % in concentration, balance essentially aluminum wherein the sum of silicon and manganese is between 0.3 and 1.0 wt. % and said iron and manganese are present in a ratio of iron to manganese between 2.5 and 4.5, said substrate being characterized by improved mechanical properties including improved ductility and relatively high tensile and fatigue strengths, a fine substantially uniform surface structure suitable for roughening, a stable $Al_6(FeMn)$ phase that precipitates out on casting and is not transferred into an undesirable $AlFe_3$ phase during heat treatment, and a ternary AlFeSi phase which appears as a fine structure.

4,802,936

METHOD AND APPARATUS FOR TAPING NONSTRAIGHT WORKPIECE EDGE

Wilhelm Riesmeier, Lübbecke, and Martin Rose, Espelkamp, both of Fed. Rep. of Germany, assignors to IMA-Norte Maschinenfabriken Klessmann GmbH & Co., Gütersloh, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,721
Int. Cl.[4] B65H 31/00
U.S. Cl. 156—64 9 Claims



1. A method of adhering a tape to a corner-defining nonstraight edge of a generally planar workpiece with an apparatus comprising:

a stationary workpiece station;

means for retaining the workpiece in the station;

a roller engageable with the workpiece and rotatable on the carriage about an axis generally perpendicular to the workpiece plane; and

a supply of the tape and an adhesive on the carriage; the method comprising the steps of:

relatively displacing the roller and workpiece and thereby rolling the roller around the workpiece edge and over the corner thereof while pressing the tape with the roller against the workpiece edge and corner;

automatically monitoring the tape feed and determining which portion of the tape will be pressed over the edge corner;

cutting a notch in the tape at the portion to be pressed to the corner; and

pressing the notched portion of the tape over the corner without overlapping the tape.

4,802,937

BELT AND TREAD TRANSFER RING AND DRUM EXPAND BLADDERS

Walter Szyms, Branford, Conn., assignor to The Armstrong Rubber Co., New Haven, Conn.

Filed Oct. 1, 1986, Ser. No. 913,991
Int. Cl.[4] B29D 23/00
U.S. Cl. 156—118 9 Claims

1. In a process for fabricating reinforced structures adapted to be employed as belt and tread transfer ring bladders and belt and tread drum expand bladders in tire building operations the steps comprising, in the following sequence:

assembling a first continuous belt of partially cured rubber on a forming drum of cylindrical cross-section;

calendering at least one ply of rubber impregnated reinforcing material over substantially the whole of the surface of said first belt wherein said reinforcing material is selected from the group consisting of fabric and filaments;

assembling a second continuous belt of partially cured rubber over said rubber impregnated reinforcing material, said first and second belts having substantially the same width and having their edges substantially in registry with each other;

folding one edge of the resulting assembly inwardly towards the opposite edge of said assembly;

thereafter folding the opposite edge of said assembly inwardly so as to overlap the previously folded edge, the location of the overlap being in the area of the finished structure which will contact the workpiece in said tire building operations; and

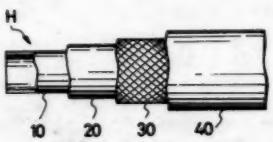
thereafter curing said assembly.

4,802,938

PROCESS FOR PRODUCING HOSES

Tetsu Kitami; Shigeru Igarashi, both of Kanagawa, and Katuya Ono, Gifu, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 878,689, Jun. 26, 1986, abandoned.
This application Aug. 11, 1987, Ser. No. 85,229
Claims priority, application Japan, Jun. 27, 1985, 60-139091
Int. Cl.[4] B29C 35/02, 47/04
U.S. Cl. 156—149 8 Claims



1. A process for the production of hoses having a plastic inner tube of reduced thickness, which comprises:

(a) extruding a thin layer of polyamide or polyester resin onto a mandrel to form an inner tube having a thickness in the range between 50 and 800 microns, said mandrel being releasable from said inner tube and preformed of polyamide or polyester, or vulcanized ethylene-propylene terpolymer rubber, butyl rubber or chlorobutyl rubber;

(b) laminating an outer tube of unvulcanized rubber by extrusion over said inner tube to form an integral hose body;

(c) vulcanizing said hose body; and

(d) removing said mandrel from said vulcanized hose body.

4,802,939

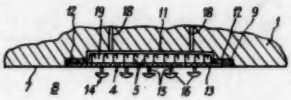
METHOD FOR ATTACHING A FASTENING TAPE TO A MOLDED ARTICLE

Patrick J. Billarant, and Bruno Queval, both of Charlotte, N.C., assignors to Aplix, S.A., Paris, France

Division of Ser. No. 676,951, Nov. 30, 1984, Pat. No. 4,693,921.
This application Sep. 4, 1987, Ser. No. 93,801
Claims priority, application France, Dec. 13, 1983, 83 19926; Jun. 26, 1984, 84 19933
Int. Cl.[4] A44B 21/00; A41H 37/00
U.S. Cl. 156—155 9 Claims

1. A method for securing a fastening member to an article to be molded, said fastening member being of the type characterized by having a base carrying numerous rows of hook-like projections for mating, releasable engagement with a loose, fibrous patch to form a fastener assembly, said method comprising the steps of:

(a) applying a thin, protective film to the fastening member to protect and sealingly enclose the hook-like projections around the entire periphery of the fastening member against leakage of molding liquid past the film onto the hook-like projections;
(b) placing the fastening member in a mold in a position wherein the hook-like projections will be exposed on the



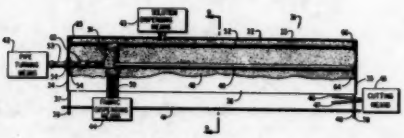
surface of the completed molded article and introducing molding liquid to the mold;
(c) curing the molding liquid to form a solid; and
(d) removing the protective film from the fastening member after the molding liquid is cured to expose said hook-like projections for mating, releasable engagement with said patch.

4,802,940

METHOD FOR COATING PIPE WITH REFRACTORY MATERIAL

Harry P. Sullins, Columbia, S.C., assignor to Richland Industrial, Inc., Columbia, S.C.

Continuation of Ser. No. 521,451, Aug. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 386,638, Jun. 7, 1982, abandoned. This application Jul. 25, 1986, Ser. No. 887,989
Int. Cl.[4] B31B *1/00*
U.S. Cl. 156—187 **18 Claims**



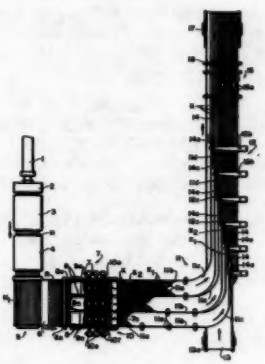
1. A method for coating an elongated pipe with a coating composition, said method comprising:
mounting said pipe for axial rotation relative to a trough containing a solution of said coating composition;
passing a web of porous material from a web dispensing means through said trough in a position below the surface of said solution for coating said web, said web being passed around a bar mounted within said trough and having a web engaging surface below the surface of said solution;
securing said web to said pipe by placing a leading end portion of said web against said pipe to extend longitudinally along a portion of the outer surface of said pipe, wrapping an adjacent portion of said web around said pipe so that said leading end portion crosses under a first complete turn of said adjacent portion and extends beyond said first turn and between said first turn and a second complete turn of said adjacent portion, and tensioning said web such that said adjacent portion of the web is drawn tightly around said pipe, the tensioning of said web causing said leading end porton to be tucked tightly under said first turn and between said first turn and said second turn so as to lock the beginning of a wrapping of said web to said pipe;
turning said pipe to pull said secured web from said web dispensing means and to wrap additional portions of said secured web around said pipe, said secured web being pulled around said bar to coat said web with said solution before said additional portions thereof are wrapped around said pipe, and said secured web being pulled around a drag member having a stationary web contacting surface before being pulled around said bar, said drag member tensioning said web before said web is pulled around said bar; and,
causing relative movement between said web dispensing means and said turning pipe in a direction parallel to the axis of said pipe to provide on the outer surface of said pipe a coating in the form of tightly wound spiral windings of said coated web extending along a coated length of said pipe.

4,802,941

METHOD OF MAKING WEBS, MATS AND THE LIKE OF REED-LIKE PLASTIC STRAWS FOR THATCHED ROOF

Max Koschorrek, Morzgerstrasse 38a, A-5020 Salzburg, Austria

Filed Apr. 6, 1987, Ser. No. 34,706
Claims priority, application Austria, Sep. 11, 1986, 2445/86
Int. Cl.[4] E04D *9/00*
U.S. Cl. 156—244.18 **15 Claims**



1. A method of making webs, mats and the like of reed-like plastic straws in a continuous automated fashion, whereby straw chains formed of straws of unequal length, arranged side by side and substantially in parallel, are affixed in an overlapping, scale-like manner to an elongated support sheet, said method comprising the steps of:
(a) arranging side by side and in parallel a plurality of plastic straws of equal lengths thereby forming a row of straws;
(b) severing said straws along at least one longitudinal axis of said row, with a varying ratio of division with a stamping tool automatically controlled to move transversely to said at least one longitudinal axis of said row thereby to form at least two straw chains having a straight edge on one side with the straw ends aligned together and a jagged edge on the opposite side with the severed straw ends unaligned;
(c) ordering said straw chains in adjacent, parallel relationship such that their straight edges are substantially parallel and are spaced apart a distance which is less than the width of said chains; and
(d) affixing said straw chains to a support sheet such that said straw chains overlap with their free jagged edges exposed.

4,802,942
METHOD OF MAKING MULTILAYER COMPOSITE HOLLOW FIBERS

Tohru Takemura, Ohtake; Hajime Itoh, Hiroshima; Jun Kamo, Ohtake, and Haruhiko Yoshida, Yamaguchi, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 878,678, Jun. 26, 1986, Pat. No. 4,713,292. This application Sep. 1, 1987, Ser. No. 91,894

Claims priority, application Japan, Jun. 27, 1985, 60-141385

Int. Cl.[4] B32B *31/16*

U.S. Cl. 156—244.13 **5 Claims**

1. A method of making a multilayer composite hollow fiber comprising (A) at least one nonporous separating membrane layer which performs a separating function and (B) at least two porous layers which perform a reinforcing function, said layer (A) and said layers (B) being alternately laminated together so as to give a structure having inner and outer surfaces formed by said layers (B), comprising the steps of:

(i) co-spinning a polymer (A') selected from the group consisting of (a) a non-crystalline polymer, (b) a crystalline polymer having a lower melting point than polymer (B'), (C) a crystalline polymer having a melt index greater than the melt index of polymer (B') and (d) a crystalline polymer containing a solvent or plasticizer which forms said separating membrane layer and a crystalline polymer (B') which forms said porous layers through a spinning nozzle of multiple tubular construction which sandwiches the spun polymer (A') between two layers of the spun polymer (B'), thereby forming a composite hollow fiber; and

(ii) stretching the resulting hollow fiber thereby imparting porosity to said layers (B) while leaving layer (A) nonporous.

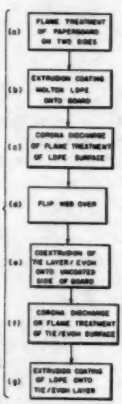
4,802,943
NON-FOIL COMPOSITE STRUCTURES FOR PACKAGING JUICE

Charles E. Gibbons; Cynthia L. Tanner, and Allan A. Whillock, all of Mobile, Ala., assignors to International Paper Company, Purchase, N.Y.

Division of Ser. No. 55,629, May 29, 1987. This application Jul. 29, 1988, Ser. No. 226,099

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—244.23 **6 Claims**


(a)
FLAME TREATMENT OF PAPERBOARD ON TWO SIDES
(b)
EXTRUSION COATING MOLTEN LDPE ONTO BOARD
(c)
CORONA DISCHARGE OF FLAME TREATMENT OF LDPE SURFACE
(d)
FLIP WEB OVER
(e)
COEXTRUSION OF TIE LAYER/ EVOH ONTO UNCOATED SIDE OF BOARD
(f)
CORONA DISCHARGE OF FLAME TREATMENT OF TIE/EVOH SURFACE
(g)
EXTRUSION COATING OF LDPE ONTO TIE/EVOH LAYER

1. A process for improving the resistance of paperboard to the migration of essential oils and/or flavorings, said process comprising the steps of:

(a) flame treating a paperboard substrate on two sides;

(b) extrusion coating a 12 lb outer layer of a low density polyethylene polymer onto said outer surface of said paperboard;

(c) corona discharge treating said outer layer of low density polyethylene polymer;

(d) flipping the coated paperboard web over;

(e) coextruding an inner sandwich comprising a 4.5 lb tie layer, a 4.0 lb ethylene vinyl alcohol copolymer layer and a 4.5 lb tie layer onto said uncoated surface of said paperboard; and

(f) extruding a 10 lb heat-sealable low density polyethylene polymer layer onto said surface of said inner sandwich of tie layer-ethylene vinyl alcohol copolymer layer-tie layer.

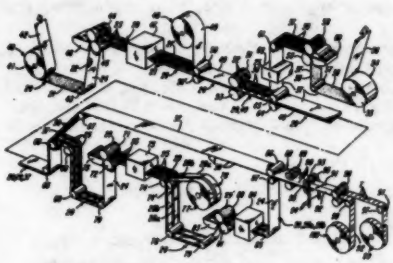
4,802,944
METHOD OF MAKING DEACTIVATABLE TAGS

S. Eugene Benge, Middletown, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 81,096, Aug. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 41,556, Apr. 22, 1987, which is a continuation-in-part of Ser. No. 912,466, Sep. 29, 1986, Pat. No. 4,717,438. This application Mar. 28, 1988, Ser. No. 177,815

Int. Cl.[4] B32B *31/16*

U.S. Cl. 156—247 **4 Claims**



3. Method of making a deactivatable tag for use in an electronic article surveillance system, comprising the steps of: providing a first web with a first series of longitudinally spaced first spiral conductors and a second web with a series of longitudinally spaced second spiral conductors, providing spaced strips of conductive material having a layer of normally non-conductive material, positioning the strips with the normally non-conductive layer adjacent either the first or the second series of conductors, adhering the first and second webs to each other, connecting the conductors of the first and second webs to each other to provide a series of spaced resonant circuits in a composite web and there being one of said strips for each resonant circuit, separating the composite web into tags each having a first conductor and a second conductor coupled to each other, and wherein the normally non-conductive layer can be rendered conductive in response to an energy level higher than that level necessary to activate the tag.

4,802,945
VIA FILLING OF GREEN CERAMIC TAPE

Patricia B. Opina, Riverside, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 917,323, Oct. 9, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 173,001

Int. Cl.[4] B32B *31/18*

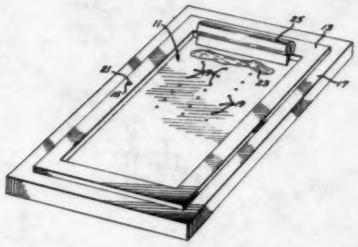
U.S. Cl. 156—247 **13 Claims**

1. A method of filling via holes disposed in a sheet of unfired pyrolyzable dielectric material with conductive material, said method comprising the steps of:

providing a sheet of unfired pyrolyzable dielectric material having a backing material secured to one surface thereof, the sheet of dielectric material and the backing material

having a predetermined pattern of via holes disposed therein;

securing the sheet of dielectric material and its backing material to a support structure with the backing material exposed;



depositing conductive material into the via holes of the sheet of dielectric material using the backing material as a mask layer; and

separating the backing material from the sheet of dielectric material to provide a sheet of unfired dielectric material having conductive material disposed in the via holes thereof.

4,802,946

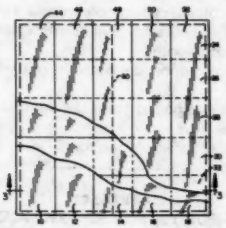
METHOD OF CONSTRUCTING LAMINATED PANELS

Howard C. Mason, 4421 SW. Coast, Lincoln City, Oreg. 97367

Filed May 21, 1987, Ser. No. 52,480

Int. Cl.[4] B32B *31/12, 31/20*

U.S. Cl. 156—264 **6 Claims**



1. A method of making a laminated product, such as plywood and the like, from veneer pieces which comprises:

preparing veneer pieces having a common length "l" in their grain direction and a common width in a cross-grain direction, and wherein the width in the veneer pieces equals the length "l" divided by a whole number, the number being greater than one,

preparing a stack of first and second layers from the veneer pieces,

one of said layers being prepared with plural veneer pieces disposed side-by-side and parallel and abutting and extending in one direction and said preparation being performed with aligning the end edges of the veneer pieces, so that in said one direction, the layer has a dimension equaling "l",

the other of said layers being prepared with plural veneer pieces disposed side-by-side and parallel and abutting and extending in a direction normal to said one direction, and the preparation of said other layer being performed with a number of veneer pieces equaling said whole number to produce a layer where side edges of the veneer pieces on opposite sides of the layer are aligned with the aligned end edges of the veneer pieces in said one layer,

during preparing of the stack applying an adhesive between the layers, and

after preparing of the stack applying pressure and requisite temperature to bond the layers together.

4,802,947

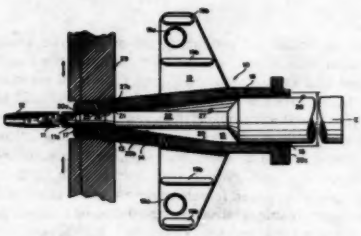
APPARATUS FOR ATTACHING A CATHETER TO A HUB

Victor L. Bartholomew, Sandy, Utah, assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 16, 1986, Ser. No. 887,004

Int. Cl.[4] B29C *57/06, 65/04;* B32B *31/20*

U.S. Cl. 156—380.5 **3 Claims**



1. A dielectric welding apparatus for use in coaxially supporting a catheter and its hub about an axis during an operation for expanding the bore of the catheter to the inside of the hub to form a flared smooth transition from the larger internal diameter of the hub to the smaller internal diameter of the catheter bore wherein the apparatus comprises:

an elongated probe located along the axis and having a minor diameter at its proximal end and said minor diameter extending axially for carrying and supporting the catheter along the axis and a major diameter at its distal end for carrying the hub in axial alignment with the catheter;

a portion on said elongated probe disposed between said minor diameter and said major diameter with at least a part thereof having a flared transition extending outwardly and distally of said minor diameter toward said major diameter for producing a funnel shaped distal end on the catheter when it is place axially over said minor diameter and biased axially up onto said flared transition, and said major diameter extending axially for cooperating with the inside of the hub when the hub is coaxially positioned about the catheter distal end to axially align the hub with respect to the catheter forming an interface between at least the funnel shaped distal end on the catheter and the inside wall of the hub; and

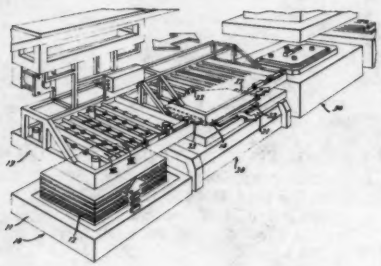
a grounding support about the hub when positioned on said probe to receive dielectric energy across the interface between the catheter and hub and to carry the hub as said probe urges the catheter funnel shaped distal end into the inside wall of the hub.

4,802,948

APPARATUS FOR PRODUCING INTERIOR TRIM COMPONENT FOR A MOTOR VEHICLE

Willibald Zimmermann, Cologne; Klaus Hartmann, and Heinz Wessel, both of Gladbach, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 813,304, Dec. 24, 1985, Pat. No. 4,781,956.
This application Dec. 5, 1986, Ser. No. 938,184
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3001354
Int. Cl.[4] B32B 31/20
U.S. Cl. 156—500 6 Claims



1. An apparatus for producing an interior trim component for a motor vehicle, said component comprising a compressed fiber base and a plastic sheet adhered to at least selected areas of a surface thereof, wherein selected portions of said base are less compressed and thicker than remaining portions of said base, said apparatus comprising a loading station followed by an alignment station followed by a shaping station followed by a sealing station, said shaping station comprising a male mold member and an opposed female mold member, said mold members being moveable relative one another into a closed position defining a gap between them of uneven thickness, whereby in said closed position said mold members are adapted to subject selected areas of a fibrous mat of substantially uniform thickness to different degrees of compression than remaining areas of said mat, and wherein said loading station comprises a first loading frame, a second loading frame and a support surface adapted to support a stack of fibrous mats, each of said loading frames comprising means for releasably gripping a fibrous mat to transport same and being vertically moveable independently of the other, said first loading frame being reciprocally moveably horizontally from a first position over said support surface to a second position over said alignment station, said second loading frame being reciprocally moveable horizontally from a first position over said alignment station to a second position over said shaping station.

4,802,949

APPARATUS FOR APPLYING AN EMBOSSING FOIL TO A FLEXIBLE MATERIAL

Reinwald Mitsam, Zirndorf, Fed. Rep. of Germany, assignor to Leonard Kurz, Furth, Fed. Rep. of Germany

Division of Ser. No. 742,216, Jun. 6, 1985, Pat. No. 4,701,235, which is a continuation of Ser. No. 476,192, Mar. 17, 1983, abandoned. This application Jul. 10, 1987, Ser. No. 71,893
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3210551
Int. Cl.[4] B44C 1/16; B32B 31/00; B30B 5/02
U.S. Cl. 156—540 15 Claims

1. Apparatus for applying an embossing foil to a portion of flexible material, comprising:

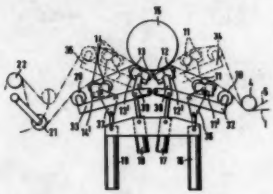
an embossing roller for embossing:

said flexible material:

means for heating said embossing roller;

an array of spaced apart pressure rollers having axes parallel to said embossing roller for movement into cooperation with said embossing roller to press said flexible material and embossing foil against said embossing roller, said array of pressure rollers including a sub-array of inner pressure rollers;

and means for controlling movement of said array of pressure rollers relative to said embossing roller in pressing said flexible material and embossing foil against said embossing roller to cause said sub-array of inner pressure rollers to be first displaced to engage said embossing roller and thence to cause said pressure rollers at respective sides of said inner pressure rollers sub-array to be progressively brought into engagement with said embossing roller.



4,802,950

ENAMEL-BONDING ETCHANT AND PROCEDURE

Theodore P. Croll, 4242 Mechanicsville Rd., Mechanicsville, Pa. 18934

Filed Apr. 12, 1988, Ser. No. 180,564
Int. Cl.[4] B44C 1/22
U.S. Cl. 156—629 6 Claims

6. A one-step tooth enamel-etching procedure for resin bonding in dentistry, comprising;

a. application of an etchant compound comprising phosphoric acid, fumed silica and silicon carbide particles to the surface of a tooth,

b. agitating said compound against the tooth with an applicator,

c. rinsing said compound from the tooth for less than 15 seconds, and

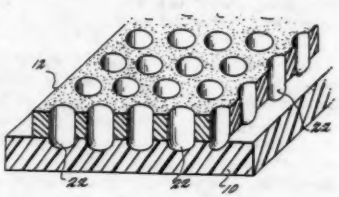
d. air-drying the surface of the tooth.

4,802,951

METHOD FOR PARALLEL FABRICATION OF NANOMETER SCALE MULTI-DEVICE STRUCTURES

Noel A. Clark; Kenneth Douglas, both of Boulder, Colo., and Kenneth J. Rothschild, Newton, Mass., assignors to Trustees of Boston University, Boston, Mass. and University of Colorado Foundation, Inc., Boulder, Colo.

Division of Ser. No. 837,376, Mar. 7, 1986, Pat. No. 4,728,591.
This application Dec. 23, 1987, Ser. No. 136,992
Int. Cl.[4] B44C 1/22; B05D 3/06; G03C 15/00, 5/00
U.S. Cl. 156—630 17 Claims



1. A method of forming a pattern on a nanometer scale comprising the steps of:

binding to a substrate surface a self-assembled two-dimen-

sionally ordered material array forming a two-dimensional spatial pattern of at least one of thickness, density and chemical reactivity variations, said pattern having a characteristic dimension of 1–50 nanometers,

forming at least one overlayer on said array; and

forming a two-dimension, nanometer scale pattern of holes in said overlayer which is determined by said pattern in said array.

4,802,952

METHOD FOR MANUFACTURING SEMICONDUCTOR ABSOLUTE PRESSURE SENSOR UNITS

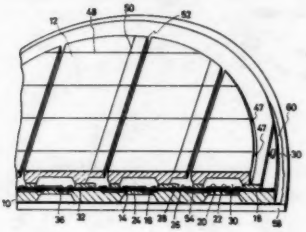
Shigeyuki Kobori; Kazuji Yamada, both of Hitachi; Ryoichi Kobayashi, Toukai; Atsushi Miyazaki, Katsuta, and Seikou Suzuki, Hitachioota, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,750

Claims priority, application Japan, Mar. 6, 1987, 62-49981

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—634 **4 Claims**



1. A method for manufacturing semiconductor absolute pressure sensor units comprising:

a step of preparing a semiconductor sensor wafer **(10)** of one conductivity type having a plurality of first recesses **(34)** formed on one surface thereof in matrix so as to constitute diaphragms **(36)**, thick boundary area supporting and surrounding the first recesses **(34)**, a plurality of piezoresistive elements **(14, 16)** of the other conductivity type formed on the other surface of the semiconductor sensor wafer **(10)** at the respective diaphragms **(36)**, first conductive layer **(24)** forming a bridge circuit with the piezoresistive elements **(14,16)** at the respective diaphragms **(36)** and input and output terminals **(26)** therefor disposed on the thick boundary area of the respective diaphragms **(36)**, glass layer **(32)** containing movable ions therein formed in matrix on the other surface of the semiconductor sensor wafer **(10)** over the thick boundary area, and second conductive strip layer **(28)** formed in contact with and in alignment with the glass layer **(32)**;

a step of preparing a semiconductor cap wafer **(12)** of substantially the same thermal expansion coefficient as that of the semiconductor sensor wafer **(10)** having a plurality of second recesses **(44)** formed on one surface thereof in matrix, a plurality of first and second channels **(46, 47)** formed on the one surface in matrix adjacent to the second recesses **(44)** arranged in matrix, and cutting marks **(48, 50, 52)** formed on the other surface of the semiconductor cap wafer **(12)**;

a step of aligning the semiconductor cap wafer **(12)** on the semiconductor sensor wafer **(10)** in such a manner that the second recesses **(44)** of the semiconductor cap wafer **(12)** overlie the respective diaphragms **(36)** of the semiconductor sensor wafer **(10)** from the other surface thereof so as to constitute reference pressure chambers **(38)** for the respective absolute pressure sensor units, the columns of the first channels **(46)** of the semiconductor cap wafer **(12)** overlie the input and output terminals **(26)** of the respective first conductive layers **(24)** and the columns of the second conductive strip layer **(28)** and the rows of the second channels **(47)** overlie the rows of the second conductive strip layer **(28)**;

a step of applying a DC voltage between the semiconductor cap wafer **(12)** and the second conductive strip layer **(28)** on the semiconductor sensor wafer **(10)** in such a manner that the semiconductor cap wafer **(12)** is applied a positive potential and the second conductive strip layer **(28)** is applied a negative potential so as to bond the semiconductor cap wafer **(12)** to the semiconductor sensor wafer **(10)** with the glass layer **(32)** containing movable ions through anodic bonding process; and

a step of cutting the bonded semiconductor cap wafer **(12)** and semiconductor sensor wafer **(10)** along the cutting marks **(48, 50, 52)** on the other surface of the semiconductor cap wafer **(12)** so as to produce a plurality of semiconductor absolute pressure sensor units.

4,802,953

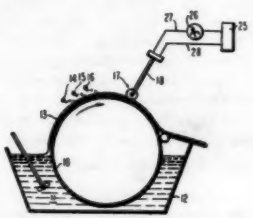
CONTINUOUS ON-LINE CONDUCTIVITY PROBE

Scot D. Hoeksema, Elkridge, and William H. Williams, Ellicott City, both of Md., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 9, 1987, Ser. No. 106,506

Int. Cl.[4] D21C *7/06;* **G01R** *27/02*

U.S. Cl. 162—263 **7 Claims**



1. Apparatus for measuring the soda loss of a mat of fibrous pulp during washing as determined by the conductivity of the liquor in the pulp mat comprising:

(a) a rotating filter screen having an outer surface;

(b) a fibrous pulp mat containing liquor on the outer surface of said filter screen;

(c) a support arm located adjacent to said filter screen;

(d) a rotating conductivity probe mounted on said support arm for rotation about a central axis through said probe, said probe comprising a pair of electrodes in side-by-side relation, spaced from one another by a layer of non-conductive material, and bound to the non-conductive material, said electrode being spaced apart a distance sufficient to prevent inadvertent leakage of current across said non-conductive material;

(e) means associated with said support arm for urging said conductivity probe into intimate contact with said fibrous mat with sufficient force to express a portion of the liquor from the fibrous mat; and,

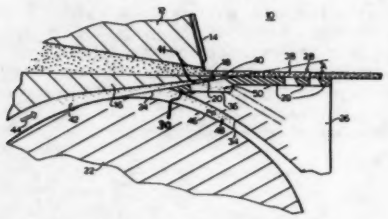
(f) means for passing a current between said electrodes and through the liquor expressed from the fibrous mat to generate a signal corresponding to the instantaneous conductivity of said liquor.

4,802,954

FORMING BOARD FOR PAPERMAKING MACHINE

Alexander Malashenko, Dollard des Ormeaux, Canada, assignor to Valmet-Dominion Inc., Lachine, Canada

Continuation of Ser. No. 932,588, Nov. 20, 1986, abandoned.
This application Jun. 6, 1988, Ser. No. 203,631
Int. Cl.[4] D21F 1/10
U.S. Cl. 162—348 10 Claims



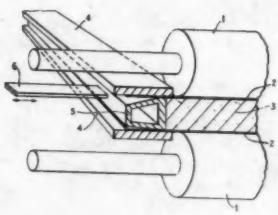
1. A papermaking machine comprising:
a forming wire;
a headbox for producing a jet of paper stock, the headbox including a lower slice lip having an apron; and,
a forming board having a rear section spaced rearwardly of the apron in the direction of paper stock travel to provide a gap between the apron and rear section, the rear section being positioned substantially in alignment with the apron, the forming board including a lead-in blade angled with respect to the rear section and projecting downwardly below the substantial alignment of the rear section and the apron, the forming wire passing over the lead-in blade and changing direction of travel as the wire passes through the gap to a direction of travel in alignment with the apron as the forming wire travels over the rear section such that the jet of paper stock leaving the headbox passes across the gap and is laid onto the forming wire travelling over the rear section of the forming board at substantially zero degrees angle of impingement to thereby minimize disturbance of the paper stock and minimize drainage as the stock leaves the headbox and impinges the wire.

4,802,955

DEWATERING BAND PRESS SIDE SEALS

Ilpo Koski, Pori, Finland, assignor to Rauma-Repola Oy, Pori, Finland

Filed Nov. 5, 1987, Ser. No. 117,636
Claims priority, application Finland, Nov. 5, 1986, 864502
Int. Cl.[4] B01D 33/04
U.S. Cl. 162—301 2 Claims



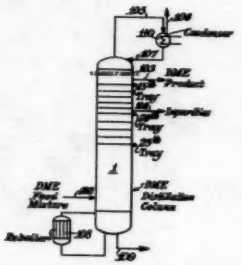
1. A dewatering band press, comprising:
a pair of rolls having ends and a spacing between the rolls;
two wires extending between the pair of rolls and pressed together by said rolls so as to retain a material to be dewatered that is fed between the two wires so as to form a pulp web, said wires adapted to move between the pair of rolls in a run direction;
two rails placed outside the ends of the rolls, each of the rails being at a level of a respective one of the pair of rolls and extending in the run direction such that a spacing between the rails is substantially equal to the spacing between the pair of rolls;
the wires being wider than and extending beyond the ends of the rolls so as to extend between said rails;
a sealing beam located between the rails and the wires, the thickness of the sealing beam being substantially equal to the spacing between the rolls less a thickness of the wires.

4,802,956

PROCESS FOR THE PURIFICATION OF DIMETHYLETHER BY DISTILLATION

Horst Dornhagen; Hartmut Hammer, and Ewald Meisenburg, all of Union Kraftstoff AG, Postfach 1663, D-5047 Wesseling, Fed. Rep. of Germany

Filed Nov. 20, 1986, Ser. No. 933,035
Int. Cl.[4] B01D 3/14; C07C 41/42
U.S. Cl. 203—42 7 Claims



1. A process for the purification of dimethylether by distillation of a dimethylether feed mixture which contains methanol and impurities which comprises feeding the feed mixture which contains dimethylether, methanol and impurities into a distillation column containing a plurality of trays below the twentyfifth tray from the top of the column, withdrawing pure dimethylether from the column above the fifteenth tray from the top of the column, withdrawing an impurity fraction stream which contains impurities with lower boiling points than that of methanol from the column at least five trays above the tray at which said mixture is fed into the column, and withdrawing head gases from the top of the column and methanol from the bottom.

4,802,957

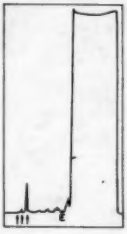
METHOD FOR MEASURING THE WATER CONTENT OF A SOLID SAMPLE USING KARL FISCHER'S COULOMETRIC TITRATION

Sinichi Kuwata, Machida; Hiromasa Katoh, Tama, and Mitsumasa Ono, Ebina, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

Filed Apr. 10, 1986, Ser. No. 850,527
Claims priority, application Japan, Apr. 26, 1985, 60-90520
Int. Cl.[4] G01N 31/16, 33/18
U.S. Cl. 204—1 T 4 Claims

1. A method for measuring the water content of a solid substance comprising the following steps:
heating a solid substance to vaporize any water therein;
contacting any water vapor formed in the heating step with an electrolytic solution for Karl Fischer's coulometric titration, wherein the electrolytic solution consists essentially of:

(1) 0.1 to 3 percent by weight, calculated as free iodine, of an iodide or iodine;
(2) sulfur dioxide;
(3) an amine selected from the group consisting of pyridine derivatives, imidazole, and imidazole derivatives; and



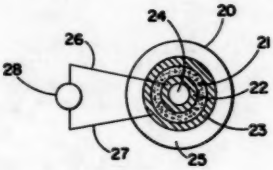
(4) a solvent which is a mixture of (a) from 3 to 30 percent by volume, based on the electrolytic solution, of a polyhydric alcohol or an ether compound thereof, (b) methanol, and (c) a halogenated hydrocarbon or an aromatic hydrocarbon; and
measuring the water content of the electrolytic solution by Karl Fischer's coulometric titration.

4,802,958

PROCESS FOR THE ELECTROCATALYTIC OXIDATION OF LOW MOLECULAR WEIGHT HYDROCARBONS TO HIGHER MOLECULAR WEIGHT HYDROCARBONS

Terry I. Mazanec, Solon, and Thomas L. Cable, Newbury, both of Ohio, assignors to The Standard Oil Company, Ohio

Filed Mar. 17, 1987, Ser. No. 26,663
Int. Cl.[4] C25B 3/02
U.S. Cl. 204—80 **21 Claims**



13. An electrocatalytic process for producing higher molecular weight hydrocarbons from methane in an electrogenerative cell which comprises
(A) providing a fuel cell comprising a solid electrolyte having a first surface coated with a conductive coating comprising metal, metal oxide or mixtures thereof capable of catalyzing the reduction of oxygen to oxygen ions, and a second surface coated with a conductive coating comprising a mixture of
(i) silver-containing compositions, and
(ii) at least one alkali metal or metal oxide and at least one alkaline earth metal or metal oxide the two conductive coatings being connected by an external circuit, wherein the first conductive surface is a cathode and the second conductive surface is the anode,
(B) passing an oxygen-containing gas in contact with the first conductive coating at a temperature of about 700° C. to about 950° C. while
(C) passing methane in contact with the second conductive coating at a temperature of about 700° C. to about 950° C., and
(D) recovering higher molecular weight hydrocarbons.

4,802,959

ELECTROSYNTHESIS OF PERSULFATE

Marek Lipsztajn, Rexdale, Canada, assignor to Tenneco Canada Inc., Islington, Canada

Filed Jun. 16, 1987, Ser. No. 62,637
Int. Cl.[4] C25B 1/28
U.S. Cl. 204—82 **12 Claims**

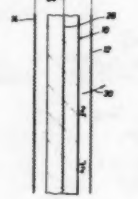
11. A method for the production of peroxydisulfuric acid, a salt thereof or a mixture of said acid and salt, which comprises electrolyzing at a temperature below about 25° C. an aqueous acid reaction medium having a pH below about 5 and containing sulfate ions provided by a sulfate ion source selected from a water-soluble sulfate, sulphuric acid and a mixture thereof using an anode having a glassy carbon surface in the presence of about 0.0002 to about 0.025 moles/L of fluoride ions to form peroxydisulfate ions at said anode.

4,802,960

ELECTROCHEMICAL CELL AND PROCESS EMPLOYING A BIASING ELECTRODE

Glenn A. Eisman, Nassau Bay, and Lloyd E. Alexander, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 4, 1986, Ser. No. 826,162
Int. Cl.[4] C25B 1/16, 1/26
U.S. Cl. 204—98 **12 Claims**



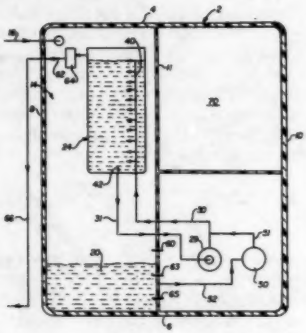
1. A method of operating a galvanic or electrolytic cell involving ionic movement where the cell has a central separator spanning the cell and permitting controlled ionic movement, the cell further having spaced anode and cathode electrodes on opposite sides of the separator, the method of operation comprising the steps of:
(a) applying DC voltage to anode and cathode electrodes of the cell having an aqueous solution of salt dissolved therein to form OH ions in the vicinity of the cathode while also forming metal ions in the vicinity of the anode;
(b) selectively transferring a species of ions across the separator in response to electrical attraction acting on the transferred ions wherein the attraction assists in ionic transfer and wherein transfer is accompanied by an unwanted transfer of a second species of ions across said separator;
(c) positioning a screen electrode with the separator wherein said screen is formed by embedding particulate conductive material in said separator and forming a conductive pathway through said particulate material; and
(d) applying a selected bias voltage to the screen, the bias voltage being independent of the DC voltage between the electrodes, to form a voltage bias repelling the second species of ions from transfer through the separator while permitting the first species of ions to pass through.

4,802,961

SILVER REMOVAL APPARATUS AND METHOD

Manfred J. Woog, 1960 "B" St., and Charles W. Schmidt, 340 School St., both of Craig, Colo. 81625

Filed Dec. 23, 1987, Ser. No. 137,272
Int. Cl.[4] C25C 1/20; C25B 15/08
U.S. Cl. 204—109 27 Claims



20. A method of recovering silver from photographic process solutions including

providing a housing having an unprocessed solution reservoir and an electrolytic cell containing an anode and a cathode disposed in relative spaced relationship,

providing pump means for delivering unprocessed solution to said cell,

maintaining said solution in said cell in a state of turbulence,

providing said pump means with a circulating pump for receiving solution from said cell and returning said solution to said cell and metering pump means for providing additional solution to said cell, and

periodically adding unprocessed solution to said cell directly or by means of said metering pump.

4,802,962

TREATMENT OF CATHODES FOR USE IN ELECTROLYTIC CELL

John F. Cairns, Cheshire, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 640,936, Aug. 15, 1984, abandoned. This application Jan. 29, 1988, Ser. No. 149,927
Claims priority, application United Kingdom, Aug. 22, 1983, 8322563; Jan. 30, 1984, 8402347; Feb. 7, 1984, 8403177
Int. Cl.[4] C25F 1/00
U.S. Cl. 204—145 R 13 Claims

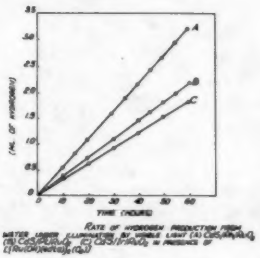
1. A method of treating the surface of a cathode in order to remove therefrom deposited iron, the cathode comprising a metallic substrate at least part of the surface of which has been activated in order to reduce the hydrogen overvoltage at the cathode when the cathode is used in the electrolysis of water or aqueous solutions, and the method comprising removing the iron deposited upon the activated surface of the cathode by contacting the activated surface with a liquid medium which reacts with and solubilizes the deposited iron, wherein, the cathode is in position in a electrolytic cell and the method is effected by contacting the cathode with the liquid medium in situ in the electrolytic cell, and wherein, the electrolytic cell contains a cation permselective membrane and wherein, the liquid medium is an aqueous solution which contains one or more soluble organic compounds selected from the group consisting of sucrose and an organic polymeric material.

4,802,963

PROCESS FOR THE PHOTOCATALYTIC DECOMPOSITION OF WATER INTO HYDROGEN AND OXYGEN

Mirza M. T. Khan; Ramesh C. Bhardwaj, and Chhaya Bhardwaj, all of Gujarat, India, assignors to Council of Scientific & Industrial Research, New Delhi, India

Filed Aug. 6, 1987, Ser. No. 82,816
Int. Cl.[4] C25G 1/02
U.S. Cl. 204—157.5 11 Claims



1. A process for the photocatalytic decomposition of water into hydrogen and oxygen which comprises loading a semiconductor having a hexagonal crystal structure with a metal selected from Pt, Rh, Ir and In and a transition metal oxide, suspending the loaded semiconductor in an aqueous solution of dioxygen complex of ruthenium, passing light through the suspended loaded semiconductor maintained under an inert atmosphere and separating the hydrogen and oxygen so formed.

4,802,964

LIQUID SEPARATION PROCESS FOR SUSPENSIONS BY A PULSATING ELECTRICAL CURRENT

Harapanahalli S. Muralidhara, Dublin, and Cecil L. Criner, Columbus, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Dec. 8, 1986, Ser. No. 938,707
Int. Cl.[4] B01D 57/02
U.S. Cl. 204—180.1 1 Claim

1. A method of dewatering an aqueous suspension of melcone corn fiber slurry or corn gluten in a dewatering chamber with an inlet and discharge outlet, and having two electrodes, one of which is water permeable, forming opposing walls of the dewatering chamber, which method comprises:

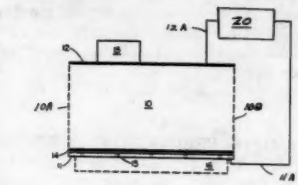
a. flowing the suspension into the dewatering chamber and between the two electrodes;

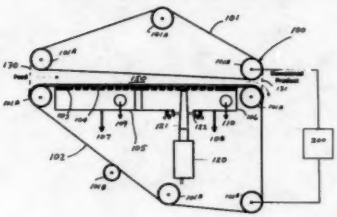
b. applying a pulsating D.C. electrical field concurrently with step a between the two electrodes for at least about 15 minutes at a pressure of not more than about 20 inches of mercury, a voltage of at least about 58, a current of at least about 450 milliamperes, and a pulse cycle of about 27 seconds on and about 33 seconds off for a melcone suspension, and for at least about 20 minutes at a pressure of not more than about 4 inches of mercury, a voltage of at least about 11, a current of at least about 2.8 amperes, and a pulse cycle of about 0.01 second on and about 0.01 second off for a gluten suspension, to cause suspended particles to migrate away from the water permeable electrode and water toward the permeable electrode;

c. concurrently with step b removing water from the suspension through the water permeable electrode; and

d. removing the dewatered suspension from the dewatering

chamber, whereby the total amount of energy employed for separating a unit of water from the suspension is less





than would be required by use of a D.C. electrical field to separate the unit of water.

4,802,965

CONCENTRATING AQUEOUS SOLUTIONS OF ORGANIC COMPOUNDS WHICH CONTAIN SALTS, WITH SIMULTANEOUS REDUCTION OF THE SALT CONTENT

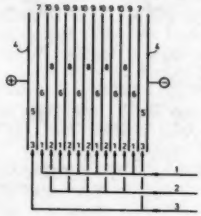
Hermann Puetter, Neustadt, and Eckhard Roske, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 16, 1985, Ser. No. 809,582

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446695

Int. Cl.[4] B01D *13/02*

U.S. Cl. 204—182.4 **16 Claims**



1. In a process for concentrating an aqueous solution of an organic compound which contains a salt, with simultaneous reduction of the salt content of this solution, the improvement which comprises:

subjecting the salt-containing aqueous solution of the organic compound as the diluate to electrodialysis, using a concentrate of an aqueous salt solution which is greater than 1 molar.

4,802,966

METHOD FOR TREATING LIQUID USED FOR ABSORBING GASEOUS SULFUR DIOXIDE IN THE PROCESS FOR DESULFURIZATION OF COMBUSTION EXHAUST GAS

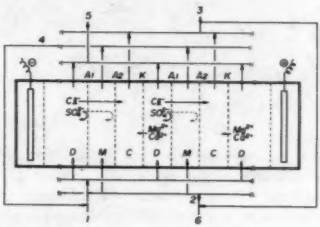
Haruo Aoki, and Yoshihiko Kudo, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 39,478

Claims priority, application Japan, Apr. 17, 1986, 61-89007

Int. Cl.[4] C25B *7/00, 13/00*

U.S. Cl. 204—182.4 **9 Claims**



1. A method for treating a liquid used for absorbing gaseous sulfur dioxide in the wet process for desulfurization of a combustion exhaust gas of the gypsum-by-producing type so as to remove chloride ions from said liquid wherein said liquid has been saturated with gypsum, has dissolved at least magneisium sulfate and magneisium chloride and has been used for absorbing gaseous sulfur dioxide, the method comprising the steps of conducting a clarification treatment and afterward passing said liquid through an electrodialyzer having three dialyzing chambers which comprise one sheet of cation-exchange membrane and two sheets of membrane selectively permeable to monovalent anions as one unit, and thereby selectively separating and removing chloride ions fom said liquid as an aqueous solution of magnesium chloride of a high concentration.

4,802,967

SURFACE TREATMENT OF POLYMERS

Wilfred C. Kittler, Thousand Oaks, Calif., assignor to Andus Corporation, Canoga Park, Calif.

Filed Apr. 8, 1987, Ser. No. 35,846

Int. Cl.[4] C23C *14/34, 14/06*

U.S. Cl. 204—192.14 **10 Claims**

1. A method of improving bondability of a polymeric material, which comprises:

(a) providing a polymeric material having a surface of low critical surface tension; and

(b) sputtering onto said surface a layer consisting essentially of carbon and having a thickness less than 300 angstroms, said layer being transparent to the naked eye.

4,802,968

RF PLASMA PROCESSING APPARATUS

Howard A. Hendrix, Morgan Hill; Howard W. Schmidt, Jr., Gilroy, and Ernest S. Ward, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1988, Ser. No. 150,361

Int. Cl.[4] C23C *14/40*

U.S. Cl. 204—298 **8 Claims**

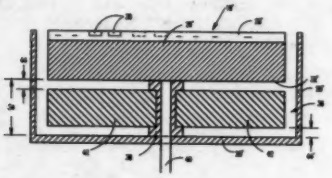
1. Sputtering apparatus for coating a substrate comprising:

a first electrode and means for supporting a target member of a suitable material on said first electrode;

a second electrode having a front portion, peripheral portions and a back portion and means for supporting on said front portion a substrate positioned adjacent to and in alignment with said first electrode;

a source of RF power arranged to impose an RF voltage across said first and said second electrodes to produce a glow discharge in the space between said first and said second electrodes;

shield means surrounding said peripheral and said back portions of said second electrode, said shield means being spaced from said back region of said second electrode to



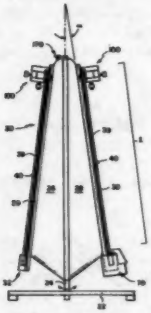
form a back space, said back space being substantially filled with means for electrically insulating said shield means from said second electrode, said means for electrically insulating being spaced a small substantially uniform distance from said shield means whereby maximum RF impedance to ground is provided and spurious sputtering is eliminated from said peripheral and said back regions of said second electrode.

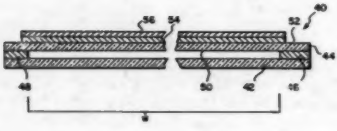
4,802,969

GEL PLATE ASSEMBLY FOR ELECTROPHORESIS

Robert R. Hellman, Jr., Southbury, Conn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 28, 1988, Ser. No. 187,668
Int. Cl.[4] G01N *27/26, 27/28*
U.S. Cl. 204—299 R **3 Claims**





1. For use in an electrophoresis device for electrophoretically separating charged compounds, the device comprising at least one support for mounting at least one gel plate assembly;

a gel plate assembly comprising a glass plate having a front surface and a rear surface, and means for confining a gel in contact with said front surface over a flow surface area, said rear surface being bonded substantially over the entire area in back of the flow surface area to means for evenly distributing temperature over said flow surface area,

whereby temperature is more effectively distributed than a similar construction wherein said rear surface merely rests in contact with a temperature-distributing means,

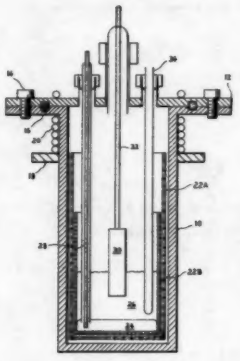
and further including a mirror coating on said rear surface, between said temperature-distributing means and said gel plate assembly.

4,802,970

PROCESS FOR PREPARING FLUORINE BY ELECTROLYSIS OF CALCIUM FLUORIDE

Gleb Mamantov, Knoxville, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1988, Ser. No. 200,093
Int. Cl.[4] C25B *1/00*
U.S. Cl. 204—60 **6 Claims**



1. A process for producing fluorine from calcium fluoride comprising:

(a) dissolving calcium fluoride in a molten salt electrolyte containing an alkali tetrafluoroborate; and

(b) electrolyzing the electrolyte at a temperature below 400° C. between an anode selected from a carbon material and nickel and a cathode selected from lead, tin, zinc, and tin/zinc alloy.

4,802,971

SINGLE RISER FLUIDIZED CATALYTIC CRACKING PROCESS UTILIZING HYDROGEN AND CARBON-HYDROGEN CONTRIBUTING FRAGMENTS

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 903,183, Sep. 3, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 144,708
Int. Cl.[4] C10G *51/04, 51/06*
U.S. Cl. 208—13 **16 Claims**

1. A riser catalytic cracking process which comprises

(a) generating at least one of hydrogen species and carbon-hydrogen fragments by cracking in the base of the riser a hydrogen-rich hydrocarbon feed containing 12 to 25 weight percent hydrogen, in the presence of a mixture of cracking catalysts of comprising (1) at least one member of the group selected from amorphous cracking catalysts, large pore crystalline cracking catalysts and admixtures thereof and (2) a shape selective zeolite catalyst wherein said generated hydrogen species and carbon-hydrogen fragments from an intermediate product; and,

(b) contacting the mixture of catalyst and intermediate product with a thermally treated heavy hydrocarbon feed

downstream of the base of the riser and catalytically cracking the heavy feed to lighter products.

4,802,972

HYDROFINING OF OILS

Simon G. Kukes, Naperville, Ill., and Jerald A. Howell, Lake Jackson, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 10, 1988, Ser. No. 154,734
Int. Cl.[4] C10G *47/34*
U.S. Cl. 208—107 20 Claims

1. A hydrofining process comprising the step of contacting a substantially liquid hydrocarbon-containing feed stream, which contains Ramsbottom carbon residue and also materials boiling in excess of about 1000° F. under atmospheric pressure conditions, with a free hydrogen-containing gas and a catalyst composition comprising at least one catechol compound of molybdenum,

in the substantial absence of solid material, and under such hydrofining conditions as to obtain at least one liquid hydrocarbon-containing product stream containing lower amounts of Ramsbottom carbon residue and lower amounts of said materials boiling in excess of about 1000° F. than said hydrocarbon-containing feed stream;

wherein said at least one catechol compound of molybdenum has been prepared by reacting, under non-reducing conditions, (a) at least one compound comprising molybdenum and oxygen with (b) an aromatic compound containing an aromatic ring of carbon and hydrogen and at least two OH groups in positions adjacent to one another.

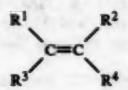
4,802,973

REMOVAL OF HYDROGEN SULPHIDE

Philip K. G. Hodgson, Walton-on-Thames; Julie A. McShea, Shepperton, and Edward J. Tinely, Farnham, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Jan. 28, 1987, Ser. No. 7,476
Claims priority, application United Kingdom, Jan. 30, 1986, 8602250
Int. Cl.[4] C10G *27/00*
U.S. Cl. 208—207 10 Claims

1. A method for scavenging hydrogen sulphide from a feedstock comprising crude oil and hydrogen sulphide which method comprises treating the feedstock with a reactant consisting essentially of a compound of general formula



where any two or more of R^1–R^4 are separate organic groups containing electronegative functional groups selected from the group consisting of ketonic, amino, nitrilic and

groups, and the remaining two or less of R^1–R^4 are hydrocarbyl groups, or hydrogen atoms and wherein the hydrocarbyl groups, when present, are selected from the group consisting of alkyl groups containing 1 to 18 carbon atoms, aryl groups and alkyl aryl groups wherein the alkyl moiety contains 1 to 18 carbon atoms, and reacting the compound in the liquid phase with the hydrogen sulphide contained therein, the compound being used in amount 1 to 50 times the amount of hydrogen sulphide present, on a molar basis.

4,802,974

HYDROFINING EMPLOYING TREATED ALUMINA MATERIAL IN FIXED BEDS

Simon G. Kukes, and Jesse R. Harris, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 12, 1987, Ser. No. 25,299
Int. Cl.[4] C10G *45/08, 45/60*
U.S. Cl. 208—217 29 Claims

1. A hydrotreating process comprising the step of contacting a substantially liquid hydrocarbon-containing feed stream, which also contains compounds of sulfur and metals, with a free hydrogen containing gas in the presence of a fixed catalyst bed comprising

(a) at least one layer of impregnated, substantially spherical alumina-containing particles and

(b) at least one layer of hydrotreating catalyst particles comprising a refractory inorganic carrier material and at least one hydrogenation promoter selected from the group consisting of transition metals belonging to Groups IIIB, IVB, VB, VIB, VIIB, IB and IIB of the Periodic Table and compounds of said transition metals;

under such hydrotreating conditions as to obtain at least one liquid hydrocarbon-containing product stream having lower concentrations of sulfur and metals than said hydrocarbon-containing feed stream;

wherein said impregnated, substantially spherical alumina-containing particles in catalyst layer (a) have been prepared by a process comprising the steps of

(A) impregnating (i) a starting material of substantially spherical alumina-containing particles, which have an initial average particle size of at least about 0.05 inch, an initial surface area, determined in accordance with ASTM method D3037, of at least about 20 cm^2/g, an initial pore volume, determined by mercury intrusion porosimetry, of at least about 0.1 cc/g, and an initial content of Al_2O_3 of at least about 80 weight-%, with (ii) a solution comprising at least one dissolved magnesium compound; and

(B) heating the material obtained in step (A) at a temperature in the range of from about 500° to about 900° C. for a period of time of at least 10 minutes, under such heating conditions as to convert at least a portion of said at least one magnesium compound absorbed in step (A) to magnesium oxide and to obtain a material having a higher retention of crush strength, measured after exposure for about 100 hours to a liquid hydrocarbon-containing stream which contains at least about 0.5 weight-% sulfur, under hydrotreating conditions at about 2250 psig total pressure, about 350 psig partial pressure of steam and about 700° F., than said starting material;

wherein a layer (a) of said impregnated, substantially spherical alumina-containing particles is placed as support layer below at least one layer (b) of said hydrotreating catalyst particles;

wherein said impregnated, substantially spherical alumina-containing particles in said support layer are promoted with at least one compound of at least one element selected from the group consisting of Y, La, Ce, Ti, Zr, Hf, Cr, Mo, W, Mn, Re, Ni, Co, Cu, Zn and P, at a level of from about 0.1 to about 2.0 weight percent of said at least one element;

and wherein said hydrotreating catalyst particles contain said at least one hydrogenation promoter at a level which is effective for lowering the concentration of sulfur and metals present in said hydrocarbon-containing feed stream under said hydrotreating conditions.

4,802,975

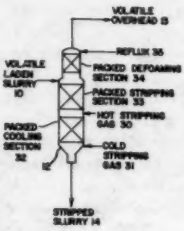
METHOD FOR STRIPPING OF RESIDUAL SOLVENT

Robert L. Mehlberg, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 758,339, Jul. 24, 1985, abandoned, and Ser. No. 594,755, Mar. 29, 1984, abandoned. This application Aug. 5, 1987, Ser. No. 82,085

Int. Cl.[4] C10G 1/04

U.S. Cl. 208—390 22 Claims



1. A method for stripping organic solvent from an aqueous feed slurry comprising a mixture of water and a solid containing adsorbed organic solvent using a vertical packed column containing: (1) an organized packing having an opening size at least about twice that of the largest solid particles in the feed slurry; (2) a hot stripping section located within said column; and (3) a cold stripping section located within said column and below the hot stripping sectiona dn being at a temperature less than the temperature of said hot stripping section; wherein;

(a) said feed slurry is introduced into an upper portion of the hot stripping section and a hot stripping gas is introduced into a lower portion of the hot stripping section;

(b) at least a portion of said adsorbed organic solvent is recovered from an upper portion of the vertical column as an overhead product;

(c) feed slurry having a reduced content of adsorbed organic solvent is passed from the hot stripping section into the cold stripping section;

(d) a cold stripping gas is passed into a lower portion of the cold stripping section, said cold stripping gas being at a temperature less than the temperature of said hot stripping gas; and

(e) a stripped feed slurry substantially completed of organic solvent is recovered from a lower portion of the vertical column as a bottom product.

4,802,976

METHOD FOR RECOVERING FINE CLEAN COAL

Francis G. Miller, P.O. Box 501, Ligonier, Pa. 15658

Filed Jan. 4, 1988, Ser. No. 140,564

Int. Cl.[4] B03B 7/00, 9/00; B03D 1/02

U.S. Cl. 209—12 2 Claims

1. In a heavy medium low specific gravity method for recovering coarse coal and fine coal and coal-bearing particles from a raw coal feed containing particles of coarse coal, fine coal, coal bearing particles, coarse shale and fine shale within a size range of 3.81 cm×0 to which an amount of

at least one heavy medium taken from the group consisting of magnetite ore and ferrosilicon is added to form a slurry having a specific gravity between about 1.27 and 1.70,

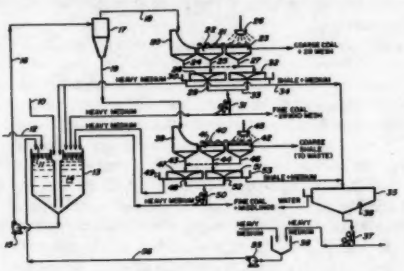
which slurry is treated in at least one cyclone to separate substantially all the coarse coal, a substantial portion of the fine coal and a major amount of the heavy medium as a cyclone overflow from substantially all the coarse shale, the remaining portion of the fine coal, coal-bearing particles, fine shale and the remaining portion of the heavy medium as a cyclone underflow,

treating the cyclone overflow on at least one sieve bend and vibrating screen to separate and recover all the coarse coal as a first screen overflow from the fine coal and heavy medium as a first screen underflow

and treating the cyclone underflow on at least one sieve bend and one vibrating screen to separate substantially all the coarse shale as a second screen overflow from substantially all the fine coal, coal bearing particles, fine shale and heavy medium as a second screen underflow, the improvement comprising:

(a) treating the first screen underflow in at least one froth-flotation cell containing at least one flotation reagent taken from the group consisting of M[BC and oil to separate substantially all the fine coal as a first flotation froth product from substantially all the heavy medium as a first sink product.

(b) separating and recovering the fine coal from any fugitive heavy medium in the first flotation-froth product of step (a) in at least one magnetic separator,



(c) recycling substantially clean heavy medium resulting from step (b) to the raw coal feed,

(d) treating the second screen underflow in at least one froth-flotation cell containing at least one flotation reagent taken from the group consisting of MIBC and oil to separate substantially all the fine coal and coal-bearing particles as a second flotation-froth product from substantially all the heavy medium as a second sink product,

(e) separating and recovering all the fine coal and coal-bearing particles from any fugitive heavy medium in the second flotation-froth product of step (d) in at least one magnetic separator, and

(f) recycling the substantially clean heavy medium resulting from step (e) to the raw coal feed.

4,802,977

PROCESS FOR SIZE SEPARATING TONER PARTICLES

Hitoshi Kanda, Yokohama, and Masayoshi Kato, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1987, Ser. No. 46,447

Claims priority, application Japan, May 12, 1986, 61-106597

Int. Cl.[4] B07B 7/00; G03G 9/08

U.S. Cl. 209—143 10 Claims

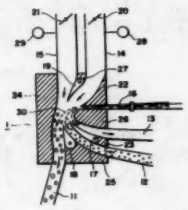
1. A process for size separation of a toner for developing electrostatic latent image, comprising:

generating a reduced pressure in a classifying chamber which is divided into at least three sections including a coarse powder section having a first outlet for withdrawing a coarse powder, a medium powder section having a second outlet for withdrawing a medium powder, and a fine powder section having a third outlet for withdrawing a fine powder, by sucking the classifying chamber through at least one of the first to third outlets;

supplying to the classifying chamber a feed toner material comprising toner particles of 20 μm or less in particle size in a proportion of 50% or more by number through a supply pipe having a supply nozzle opening into the classifying chamber at a velocity of 50 m/sec to 300 m/sec along with a gas stream flowing through the pipe;

controlling the absolute value of a static pressure P_1 to 150 mm.aq. or above in a first gas introduction pipe having a first gas inlet opening into the classifying chamber at a position upstream of the first gas inlet by a first gas introduction control means;

controlling the absolute value of a static pressure P_2 to 40 mm.aq. or above in a second gas introduction pipe having a second gas inlet opening into the classifying chamber at a position just upstream of the second gas inlet by a second



gas introduction control means, the second gas inlet being disposed farther than the first gas inlet with respect to the supply nozzle; and

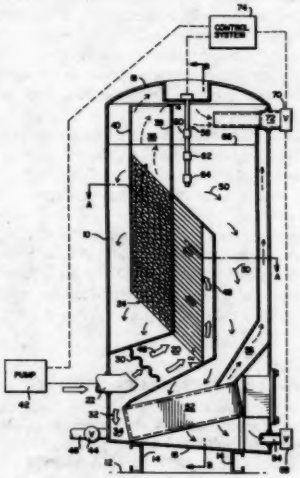
distributing the feed toner material supplied to the classifying chamber into at least the coarse powder section, the medium powder section and the fine powder section utilizing inertia force of the feed toner particles in the gas stream and centrifugal force of the curved gas stream imparted by a Coanda effect, wherein the absolute value $|P_1|$ of the static pressure P_1 and the absolute value $|P_2|$ of the static pressure P_2 satisfying the relation of $|P_1| - |P_2| \geqq 100$ (mm.aq.).

4,802,978

OIL-WATER SEPARATOR

Michael B. Schmit, and Robert T. McTighe, both of Mitchell, S. Dak., assignors to McTighe Industries, Inc., Mitchell, S. Dak.

Filed Feb. 27, 1987, Ser. No. 19,945
Int. Cl.[4] B01D *17/028*
U.S. Cl. 210—104 **22 Claims**



1. An oil-water separator comprising:

(a) a tank;

(b) inlet means located in a lower portion of the tank and defining a flow path to direct an oil-water mixture into the tank;

(c) diffusion baffle means in the inlet means, the diffusion baffle having a corrugated surface;

(d) a coalescing pack comprising a plurality of substantially parallel generally planar oleophilic plates, each plate having a generally polygonal shape with a corner and being oriented such that first and second sides of each plate extending from the corner form acute angles with a generally horizontal plane passing through the corner, the plate pack located within the tank above the inlet means such that the oil-water mixture flows across the plates from the first side toward an opposite, third side through the plate pack between the plates causing the oil particles to separate from the water and to coalesce on the underside of the plates;

(e) a plurality of substantially parallel corrugations formed on major surfaces of each plate extending generally transverse to the flow of oil-water mixture across the plates such that oil particles coalescing on the underside of each plate are directed to a fourth side of each plate;

(f) means defining an oil relief channel in fluid communication with the fourth sides of the plates in the pack to direct the separated oil into an upper portion of the tank separate from the oil-water mixture flowing across the plates;

(g) a clean water outlet;

(h) water channel means to direct water from the plate pack to the clean water outlet; and

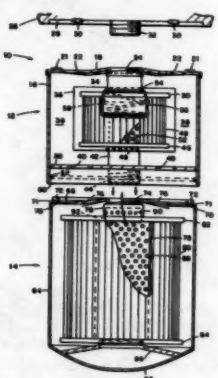
(i) oil outlet means located in the upper portion of the tank to facilitate withdrawal of the separated oil therefrom.

4,802,979

FLUID FILTER HAVING SEPARABLE ELEMENTS AND REMOVABLE END CLOSURES

Frank W. Medley, III, 45 East 18th St., Cookeville, Tenn. 38501

Continuation-in-part of Ser. No. 899,924, Aug. 25, 1986, Pat. No. 4,695,377. This application Jul. 17, 1987, Ser. No. 74,722
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—132 **9 Claims**



1. A fluid filter for attachment to a filter base having a base outlet for transmitting fluid under pressure to the filter and having a base inlet for receiving fluid from the filter;

a can defining a cavity and having first and second ends;

first inlet means for receiving fluid into the first end of said can;

first outlet means for transmitting fluid from the first end of said can;

second inlet means for receiving fluid into the second end of said can;

second outlet means for transmitting fluid from the second end of said can;

first attachment means for detachably attaching the first end of said can to the filter base and for sealably interconnecting the base outlet with said first inlet means of said can and the base inlet with the first outlet means;

second attachment means configured for detachably attaching the second end of said can to the first end of said can and for sealably interconnecting said second outlet to said first inlet and said second inlet to said first outlet, whereby two of said cans may be attached together with the oil being delivered between said two cans from the first outlet of one can to the second inlet of the other can and to the first inlet of one can from the second outlet of the other can;

flow directing means for directing fluid flow in said can from said first inlet means to said second outlet means and from said second inlet means to said first outlet means;

said flow directing means being configured and operable to direct at least some fluid flow through said cavity;

end cap means for sealably engaging the second end of said can and being configured to direct fluid flow from said second outlet to said second inlet of said can; and

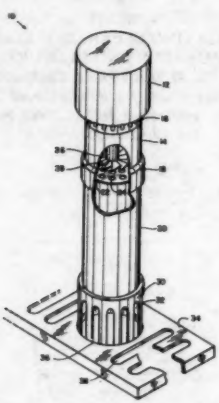
means for detachably fastening said end cap means to the second end of said can.

4,802,980

AQUARIUM FILTER

Charlotte E. Gilkey, and Hazel E. Gilkey, both of P.O. Box 272, Dixon, Ill. 61021

Filed Nov. 16, 1987, Ser. No. 120,963
Int. Cl.[4] A01K *63/04*
U.S. Cl. 210—169 **5 Claims**



1. An aquarium filter, comprising:

a hollow base (34) adapted to be covered with gravel in the bottom of an aquarium and having;

a plurality of water intake slots (38) in said base;

a cylindrical upstanding connector (30) communicating with the hollow interior of said base and having;

a plurality of vertical slots (32) disposed circumferentially around said connector;

an upstanding water conduit removably received in said connector and having a lower portion (20),

fiber and charcoal filter means (21) in said lower portion of said water conduit;

a top portion (14) of said water conduit removably connected by an annular over fitting joint (18) to said lower portion;

a motor (12) mounted on an upper end of said top portion of said water conduit;

a drive shaft (26) of said motor extending axially within said top portion;

a pump impeller (28) mounted on said drive shaft;

an apertured (24) shield plate (22) in said water conduit, beneath said pump impeller;

means defining a plurality of outlet holes (16) extending circumferentially around said top portion of said water conduit; and

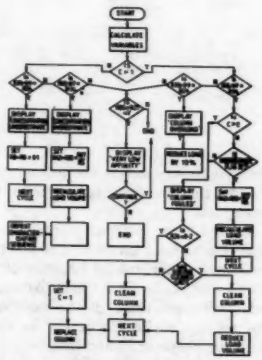
said outlet holes being above said pump impeller and beneath said motor.

4,802,981

AUTOMATIC CHROMATOGRAPHY APPARATUS

Andrew C. Kenney, Windsor; Philip W. Thompson, Burnam, and John L. Harris, Slough, all of England, assignors to Oros Systems Limited, England

Filed Nov. 4, 1987, Ser. No. 117,014
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **9 Claims**



1. Automatic chromatography apparatus comprising a column packed with adsorbent or attractant material;

means for supplying an elutant solution to the column;

loading means for loading controlled quantities of a material into the column, the material containing a substance to be eluted;

automatic control means which control the loading means so as to load the column with a first charge of the material and subsequently to load the column with a second charge of the material, the first charge being sufficiently small to ensure that the capacity of the column is not exceeded and the second charge being sufficiently large to ensure that the capacity of the column is exceeded;

first monitoring means for monitoring and controlling flow rate to provide accurate flow information to enable peak area integration;

second monitoring means which monitor the peaks of elution of the substance from the column resulting from the first and second charges of material; and

processing means connected to the monitoring means and arranged to integrate the elution peak with respect to the first charge of material so as to derive the concentration of the substance in the material, and to determine from the peak of elution of the substance from the column resulting from the second charge of material the maximum practical capacity of the column for the said substance

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4,802,982

SPIRAL-WOUND MEMBRANE WITH IMPROVED PERMEATE CARRIER

Larry A. Lien, Solana Beach, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

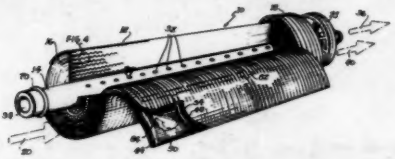
Filed Oct. 1, 1987, Ser. No. 103,633
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—247 **9 Claims**

7. A filtration module for separating a fluid permeate from a mixture of the fluid and a second component, comprising:

a self-supporting membrane made from an amorphous-locked poly(tetrafluoroethylene) polymer having a micro-

structure characterized by nodes interconnected by fibrils in intimate contact with said membrane, said membrane having pores sized to allow passage of the permeating fluid in a generally transverse direction while rejecting passage of the second fluid component therethrough;

a permeate carrier layer of non-woven ribbed channel material, having a membrane-contacting surface with a plurality of generally parallel ribs interconnected by a web-like matrix of much smaller fibrils, said ribs permeate-carrying channels formed between said ribs extending in a preselected direction, said channel material surface adhering to



said membrane so as to maintain said membrane taut as a working pressure is applied across the membrane to draw said permeate therethrough; and

conduit means for conducting the fluid permeate away from said channels, including a product collection tube about which said membrane and said layer are spirally wound such that said permeate carrier layer of channel material provides the sole path for the permeate to said product collection tube.

4,802,983

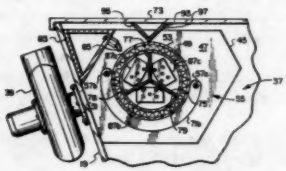
HOPPER LOADING DIRECTLY INSERTABLE HORIZONTALLY MOUNTED CYLINDRICAL SEGMENTED BORE PLEATED FILTER SYSTEM FOR ROTARY BROOM SWEEPERS

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Continuation of Ser. No. 5,232, Jan. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 757,011, Jul. 19, 1985, Pat. No. 4,650,504. This application Feb. 4, 1988, Ser. No. 148,149

Int. Cl.[4] B01D *45/18*

U.S. Cl. 55—302 **6 Claims**



1. An expendable, permanently segmented bore filter element comprising:

a hollow cylindrical filter body circumscribing an axis and adapted to filter particulate matter from fluid flowed laterally inwardly through said body into the interior thereof, said body having:

a continuous, uninterrupted cross-section extending along its length,

a generally cylindrical interior surface, and

an open end defining a bi-directional fluid flow opening through which fluid may be flowed in opposite axial directions into and out of the interior of said body; and

partition means for permanently dividing the interior of said hollow body into a plurality of separate, axially extending segments, in a manner preventing fluid cross flow between said segments during operation of said filter element, said partition means having a plurality of outer side edge surfaces permanently secured to said cylindrical interior surface of said body,

whereby a backflushing fluid flow from an external source of pressurized backflushing fluid may be directed axially inwardly through said bi-directional opening into one of said plurality of segments simultaneously with the axially opposite flow through the remainder of said plurality of segments of filtered fluid exiting said bi-directional opening, and the filter body, and the partition means permanently secured therein, may simply be discarded at the end of the useful life of the filter body and replaced with another filter body having partition means permanently secured therein.

4,802,984

COMPOSITE SEMIPERMEABLE MEMBRANE

Warren A. Waite, Burlington, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed May 4, 1988, Ser. No. 190,204

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—490 **9 Claims**

1. A thin film composite semipermeable membrane comprising a porous substrate having a surface layer of an ultrathin film formed by polymerization of an aqueous mixture of a water emulsion of water insoluble polymers or copolymers and an amino compound having at least two secondary amino groups using a polyfunctional cross-linking agent capable of reacting with secondary amino groups.

4,802,985

POROUS WATER-TREATING MATERIAL

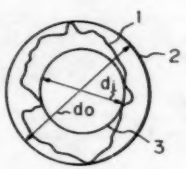
Shuighi Sugimori, and Tomihiko Kawamura, both of Otake, Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Continuation of Ser. No. 702,637, Feb. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 563,531, Dec. 20, 1983, abandoned, which is a continuation of Ser. No. 368,249, Apr. 15, 1982, abandoned. This application May 1, 1987, Ser. No. 51,235

Claims priority, application Japan, Jun. 19, 1981, 5995743; Feb. 22, 1984, 59-30191; Feb. 23, 1984, 59-31480; Feb. 23, 1984, 59-31481; Feb. 23, 1984, 59-31482; Feb. 23, 1984, 59-31483

Int. Cl.[4] B01D *39/04*

U.S. Cl. 210—502.1 **10 Claims**



1. A porous water-treating material, in the form of pellets comprising cut porous strands each comprising a resinous matrix material consisting essentially of at least one member selected from the group consisting of organic thermoplastic polymer materials and mixtures of at least one organic thermoplastic polymer material with at least one inorganic particulate material in an amount of from 20% to 75% based on the weight of the resinous matrix material, and at least one organic cationic cross-linked polymer material, and each having a number of pores formed therein and connected to each other and an irregularly rugged peripheral surface; the irregular ruggedness being to an extent such that, in any cross-sectional profile of each cut porous strand, the ratio of the diameter of a circumscribed circle to that of an inscribed circle in the cross-sectional profile is in the range of from 1.10:1 to 5.00:1, that, in any side projection profile of each cut porous strand observed in a radius direciton thereof, the ratio of the distance between a

pair of circumscribed lines to that between a pair of inscribed lines in the side projection profile, the circumscribed and inscribed lines being parallel to the longitudinal axis of the cut porous strand, is in the range of from 1.10:1 to 3.00:1, and that in the side projection profile of each cut porous strand, an average D of the distance Do between the circumscribed lines and the distance Di between the inscribed lines is in a range of from 0.5 to 5.0 mm, and the length of the profile is in a range of from 0.3 times to 3.0 times the average D.

4,802,986

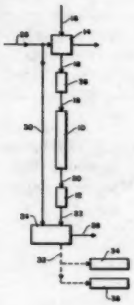
HYDROCARBON GROUP-TYPE ANALYZER SYSTEM

Paul C. Hayes, Jr., Kettering, and Steven D. Anderson, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 905,413, Sep. 9, 1986, abandoned. This application Feb. 12, 1988, Ser. No. 160,746

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—635 **3 Claims**



1. A method of analysis by high performance liquid chromatography of a sample of hydrocarbon compounds contained in solution into the following three components: saturates, alkyl benzenes, and polynuclear aromatics, which comprises the steps of:

(a) introducing said sample into a first column packed with a porous silica type packing material having a polar amino-cyano bonded phase;

(b) thereafter introducing into said first column an organic chlorine-containing eluent;

(c) introducing the eluate from said first column into a second column packed with a tetranitrofluoroenimino packing material;

(d) passing the eluate from said second column into a dielectric constant detector to detect the eluate quantitatively for saturates, alkyl benzenes, and polynuclear aromatics, the three components having been chromatographically separated by steps (a), (b) and (c).

4,802,987

SELECTIVE PERMEATION OF AROMATIC HYDROCARBONS THROUGH POLYETHYLENE GLYCOL IMPREGNATED REGENERATED CELLULOSE OR CELLULOSE ACETATE MEMBRANES

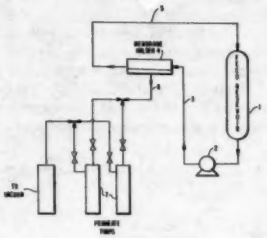
Laura E. Black, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Feb. 24, 1984, Ser. No. 583,104

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—640 **2 Claims**

1. A method for separating a feed stream containing a mixture of aromatic and aliphatic hydrocarbons into aromatic rich and aromatic lean streams by selectively permeating, under pervaporation conditions, the aromatic content through a regenerated cellulose or cellulose acetate membrane which has a dry thickness of from about 10 to 25μ and a molecular weight cut-off in the range of from about 10,000 to 50,000, which



membrane is impregnated with from 10 to 25 2r% polyethylene glycol having a molecular weight in the range of about 600–14,000.

4,802,988

DEHYDRATION OF GLYCOLS

Craig R. Bartels, Wappinger Falls, and John Reale, Jr., both of Wappinger Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 17, 1987, Ser. No. 97,766

Int. Cl.[4] B01D *15/00, 13/00*

U.S. Cl. 210—640 **13 Claims**

1. The method of concentrating a charge aqueous solution of a glycol which comprises

maintaining a non-porous separating layer of thickness of 1–10 microns of cast polyvinyl alcohol of molecular weight $\overline{M}_n$ of 20,000–200,000 which has been crosslinked in the presence of acid catalyst, with an aliphatic polyaldehyde containing at least three carbon atoms including those in said aldehyde groups and thereafter cured at 100° C.–200° C.;

maintaining a pressure drop across said non-porous separating layer of polyvinyl alcohol;

passing a charge aqueous solution of a glycol into contact with the high pressure side of said non-porous separating layer of polyvinyl alcohol whereby at least a portion of said water in said charge aqueous solution and a lesser portion of glycol pass by pervaporation through said non-porous separating layer of polyvinyl alcohol as a lean mixture containing more water and less glycol then are present in said charge aqueous solution and said charge aqueous solution is converted to a rich liquid containing less water and more glycol than are present in said charge aqueous solution;

recovering from the low pressure side of said non-porous separating layer of polyvinyl alcohol said lean mixture containing more water and less glycol than are present in said charge aqueous solution, said lean mixture being recovered in vapor phase at a pressure below the vapor pressure thereof; and

recovering from the high pressure side of said non-porous separating layer said rich liquid containing a lower water content and a higher glycol content than are present in said charge aqueous solution.

4,802,989

SYSTEM FOR PURIFYING DYE

Masahiro Haruta, Funabashi; Kunitaka Ozawa, Tokyo, and Takashi Hamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

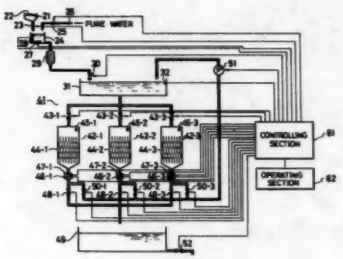
Continuation of Ser. No. 635,285, Jul. 27, 1984, abandoned. This application Oct. 29, 1986, Ser. No. 925,483

Claims priority, application Japan, Jul. 28, 1983, 58-136803; Jul. 28, 1983, 58-136804; Jul. 28, 1983, 58-136805; Jul. 28, 1983, 58-136806; Jul. 28, 1983, 58-136807; Jul. 28, 1983, 58-136808; Jul. 28, 1983, 58-136809; Jul. 28, 1983, 58-136810; Jul. 28, 1983, 58-136811

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[4] B01D *15/04;* B01J *47/02*

U.S. Cl. 210—688 10 Claims



1. A dyestuff solution refining system to purify an aqueous dyestuff solution containing metal ion contaminants comprising:

preparation means for producing a dyestuff solution;

refining means including (a) ion-exchange means for removing metal ions from said dyestuff solution; (b) transfer means for transferring said dyestuff solution to said ion-exchange means; (c) discharge means for discharging said dyestuff solution from said ion-exchange means; and (d) metal ion sensor means for detecting the metal ion concentration in said discharge dyestuff solution and for generating an output responsive to said detected metal ion concentration;

control means including (i) comparison means for receiving said output from said metal ion sensor means, for comparing said output with a predetermined value, and for generating an output responsive to differences between said detected metal ion concentration and said predetermined value, (ii) fractionation means for fractionating said discharged dyestuff solution in response to said output from said comparison means into a poriton having a metal ion concentration at or below said predetermined value and a portion having a metal ion concentration above said predetermined value; and (iii) circulation means for recycling said discharged dyestuff solution portion having a metal ion concentration above said predetermined value to said ion-exchange means; and

a reservoir for collecting said discharged dyestuff solution portion having a metal ion concentration at or below said predetermined value.

4,802,990

SOLUTION AND METHOD FOR DISSOLVING MINERALS

Eugene L. Inskeep, Jr., 20320-14th Ave. W., Lynnwood, Wash. 98036

Filed Jul. 30, 1987, Ser. No. 79,810

Int. Cl.[4] C02F *5/14*

U.S. Cl. 210—699 8 Claims

8. A method of dissolving mineral salts in water systems comprising contacting the mineral salts with an effective amount of a solution consisting essentially of water and six moles per liter of 1-hydroxyethane, 1, 1-diphosphonic acid mixed with one mole per liter of hydroxymethylene phosphonic acid, phosphonoformic acid, sulfamic acid, oxalic acid, hydroxyacetic acid, 2-amino ethane sulfonic acid, or fluoroboric acid and neutralized to a pH of 7.0 with potassium hydroxide or ammonia, and a polymeric dispersant.

4,802,991

METHOD AND APPARATUS FOR WATER PURIFICATION

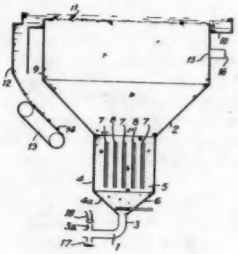
George Miller, Bogota, Colombia, assignor to Hidrotronic Watercleaning Systems, Ltd., Switzerland

Filed Oct. 2, 1984, Ser. No. 656,866

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336460

Int. Cl.[4] C02F *1/46, 1/52*

U.S. Cl. 210—705 21 Claims



1. A water purification process comprising:

directing water to be purified into an electrolysis chamber having at least two electrodes having voltages of different polarity and made of multi-valent metals, the electrodes being surrounded with a moving bed of solid, non-conductive particles whose specific density is greater than that of the contaminated water;

passing the contaminated water through the moving bed and past the at least two electrodes in a generally vertically upward direction to form hydrophobic floc;

directing the floc, water and a portion of the solid particles from the electrolysis chamber to a flocculation chamber directly connected to an upper end of the electrolysis chamber;

returning the solid particles from the flocculation chamber to the electrolysis chamber past the at least two electrodes in a generally vertically downward direction to clean the electrodes.

4,802,992

REMOVAL OF DISPERSED OIL FROM WATER

Dodd W. Fong, Naperville, and Ann M. Halverson, Wheaton, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 740,436, Jun. 3, 1985, abandoned. This application Jun. 5, 1987, Ser. No. 58,826

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.[4] B01D *17/05*

U.S. Cl. 210—709 3 Claims

1. A process for clarifying dispersed oil containing water comprising:

the addition of a polymer of a quaternary ammonium salt of 1-acryloyl-4-methyl piperazine to water containing dispersed oil in an amount effective to clarify said water by elimination of said dispersed oil.

4,802,993

METHOD OF TREATING LIQUID WASTES CONTAINING HEAVY METAL CHELATE COMPOUNDS

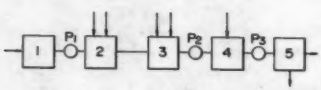
Seiji Katoh, Yokosuka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 754,448, Jul. 12, 1985, abandoned. This application Jun. 22, 1987, Ser. No. 64,562

Claims priority, application Japan, Jul. 13, 1984, 59-144249; Jul. 13, 1984, 59-144250; Jul. 13, 1984, 59-144251

Int. Cl.[4] C02F *1/56*

U.S. Cl. 210—725 6 Claims



1. A method of treating aqueous plant waste containing copper chelate compounds and chelating agents which comprises the steps of:

reducing the pH of the waste to 4 or less;

adding heavy metal ions of at least one member selected from the group consisting of Fe^{++}, Fe^{+++}, Cu^{++}, Ni^{++} and Zn^{++} simultaneously or successively to said waste having the reduced pH, the amount of heavy metal ions added as compounds being such that the equivalent ratio of heavy metal ions to chelating agents contained in said aqueous plant waste is at least 1.5:1,

wherein the Fe^{++}, Fe^{++} and Cu^{++} ions are obtained by the addition of ferrous sulfate, ferric sulfate and copper sulfate, respectively; the Ni^{++} and Zn^{++} ions are obtained by the addition of nickel sulfate or nickel chloride and zinc chloride, respectively; or the heavy metal ions are added as sludges containing heavy metal ions and Ca^{++}

adjusting the pH of the treated waste by adding a solution containing Ca^{++} ions to provide a pH of 9 or more and to produce copper hydroxide;

adding an anionic polyacrylamide flocculant to precipitate the copper hydroxide; and

separating the thus-produced hydroxide from the thus-treated aqueous plant waste.

4,802,994

BIOCIDE TREATMENT TO CONTROL SULFATE-REDUCING BACTERIA IN INDUSTRIAL PROCESS WASTE WATERS

Richard J. Mouché , Batavia, and Mei-Jan L. Lin, Naperville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 886,480, Jul. 17, 1986, abandoned. This application Aug. 18, 1987, Ser. No. 88,011

Int. Cl.[4] C02F *1/72*

U.S. Cl. 210—759 4 Claims

1. A method of controlling sulfate-reducing bacteria in flue gas scrubber sludges or slurries produced from scrubbing gases in utilities, said sludges or slurries having a sulfate-reducing bacteria population greater than 10 colonies per ml which comprises treating said sludges or slurries with a biocidal composition comprising:

A. Hydrogen peroxide, and

B. A non-oxidizing organic biocide effective against sulfate-reducing bacteria selected from the group consisting of sodium dimethyldithiocarbamate/disodium ethylene bisdithiocarbamate in a 1:1 weight ratio, metronidazole and gluteraldehyde with the dosage of A being at least 1,000 ppm by weight of the sludges or slurries and the dosage of B being within the range of between about 5–500 ppm by weight of the sludges or slurries.

4,802,995

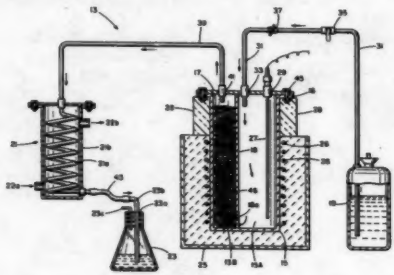
METHOD FOR DECOMPOSING THE CYANIDE RADICAL IN CYANIDE-BEARING WASTES OR MATERIALS

John Dvorscek, Oak Lawn; William Rostoker, and Arne R. Jarnholm, both of Chicago, all of Ill., assignors to Rostoker, Inc., Burnham, Ill.

Filed Jun. 5, 1987, Ser. No. 59,123

Int. Cl.[4] B01D *17/00*

U.S. Cl. 210—761 30 Claims



1. A method for chemically decomposing the cyanide radical in a cyanide-bearing waste or material comprising the steps of:

introducing said cyanide-bearing waste or material into a closed retort;

introducing water into said closed retort;

heating said closed retort to a temperature in excess of the critical temperature of reaction between water and the cyanide radical so that said water hydrolyzes with and decomposes a substantial quantity of said cyanide radical in said cyanide-bearing waste or material sufficient to form at least two new chemical products one of which includes the carbon constituent and the other of which includes the nitrogen constituent of said cyanide radical; and

venting, from said closed retort, a substantial portion of any gaseous products which result from the preceding steps.

4,802,996

BIOCIDES FOR TREATING INDUSTRIAL WATERS, PARTICULARLY FLUE GAS DESULFURIZATION SCRUBBER SLUDGE

Richard J. Mouche', Batavia, and Mei-Jan L. Lin, Naperville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 911,853, Sep. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 886,480, Jul. 17, 1986, abandoned. This application Sep. 3, 1987, Ser. No. 92,826

Int. Cl.[4] C02F *1/68*

U.S. Cl. 210—764 3 Claims

1. A method of controlling sulfate-reducing bacteria in flue gas scrubber sludges produced from scrubbing gases in utilities which sludges have a sulfate-reducing bacteria population greater than ten colonies of sulfate-reducing bacteria per ml of said sludges, which comprises treating said sludges with an effective amount of a sulfate-reducing bacterial biocidal composition chosen from the group consisting of a 1:1 weight ratio of sodium dimethyldithiocarbamate and disodium ethylene bisdithiocarbamate, and glutaraldehyde.

4,802,997
METHOD FOR THE TREATMENT OF TEXTILE SURFACES AND COMPOSITIONS FOR USE THEREIN

Rodney T. Fox, Cottingham; Raymond A. Cowen, Woodfield Lane; Hazel Pool, Derby, and Robert V. Cook, Aston on Trent, all of Great Britain, assignors to Reckitt & Colman Products Limited, London, United Kingdom

Filed Aug. 21, 1987, Ser. No. 87,784
Claims priority, application United Kingdom, Aug. 28, 1986, 8620845
Int. Cl.[4] D06M *13/40*
U.S. Cl. 252—8.6 27 Claims

1. A method for the treatment of a textile surface which comprises the steps of:

applying to the textile surface a solids treatment composition, which comprises from 0.3 to 70% of a hydrogel swollen with a treatment fluid containing from 5 to 99.5% water, and an effective amount of treatment agent to release fluid from the hydrogel to effect treatment of the surface;

allowing the composition to reabsorb fluid;

allowing the textile surface to become substantially dry; and

removing any visible residue of the treatment composition from the textile surface.

4,802,998
POWDER-FORM LUBRICANT ADDITIVES FOR WATER-BASED DRILLING FLUIDS

Heinz Mueller, Wuppertal, and Claus-Peter Herold, Mettmann, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 70,858
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1986, 3622826
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.514 13 Claims

1. A powder-form lubricant additive for water-based drilling fluids, consisting essentially of

a. from about 95 to 30% by weight, based on the total weight of the powder, of a highly disperse silica having an average particle diameter of from about 5 to about 50 nm and a surface area of from about 50 to about 300 m^2/g, and;

b. from about 5 to about 70% by weight, based on the total weight of the powder, of one or more of

i. fatty acid alkyl ester of the formula

$$R^1COOR^2 \quad (I)$$

in which R^1 is a straight-chain or branched, saturated or mono- or polyunsaturated C_9–C_{21} alkyl or alkenyl radical, and R^2 is a straight-chain or branched C_1–C_{12} alkyl radical,

ii. a polyol ester obtained by reaction of a di- or polyhydroxy compound with a carboxylic acid of the formula

$$RCOOH \quad (II)$$

in which R is a straight-chain or branched, saturated or mono- or polyunsaturated C_5–C_{21} alkyl or alkenyl radical, and

iii. a distillation residue from the transesterification of natural fatty acid esters.

4,802,999
LUBRICATING GREASE

Takehiro Koizumi, and Hideo Matsuzawa, both of Tokyo, Japan, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 934,103, Nov. 24, 1986, abandoned. This application Mar. 2, 1988, Ser. No. 163,245
Claims priority, application Japan, Apr. 30, 1986, 61-98100
Int. Cl.[4] C10M *123/02*
U.S. Cl. 252—18 9 Claims

1. A lubricating grease comprising a base oil containing about 2–30 wt. % of a thickener consisting essentially of the combination of:

a. lithium soap of C_{12-24} hydroxyfatty acid,

b. lithium phosphate salt produced from phosphoric or phosphorous acid ester or a mixture thereof, and

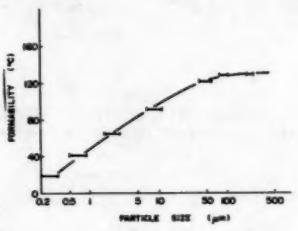
c. dilithium borate,

the amount of phosphoric or phosphorous acid ester being 0.05–15 parts by weight and the hydroxyfatty acid being 3–100 parts by weight per part by weight of boric acid, respectively.

4,803,000
LUBRICANT FOR COLD PLASTIC WORKING OF ALUMINUM ALLOYS

Takao Uematsu; Hiroshi Suzuki, both of Hitachi; Shigeki Komatsuzaki, Mito, and Fumio Nakano, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

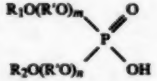
Filed Jun. 17, 1986, Ser. No. 875,444
Claims priority, application Japan, Jun. 19, 1985, 60-131826
Int. Cl.[4] C10M *105/32*, *129/68*
U.S. Cl. 252—32.5 17 Claims



1. In a process for cold plastic working an aluminum alloy comprising age-hardening a workpiece of age-hardening type aluminum alloy, coating the workpiece with a lubricant for plastic working and conducting plastic working, the improvement wherein as the lubricant, there is used a lubricating composition consisting essentially of

(A) at least one member selected from the group consisting of (a), (b) and (c) in an amount of 3% by weight or more,

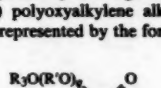
(a) a polyoxyalkylene alkyl ether phosphate diester represented by the formula:



(I)

wherein R_1 and R_2 are independently an alkyl group having 12 to 18 carbon atoms; R' is a lower alkylene group; m and n are independently an integer of 1 or more and m+n=2 to 15,

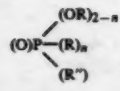
(b) polyoxyalkylene alkylphenyl ether phosphate diester represented by the formula:



(2)

wherein R_3 and R_4 are independently a phenylalkyl group, the alkyl group of which has 8 to 9 carbon atoms; R' is a lower alkylene group; q and r are independently an integer of 1 or more and q+r=2 to 15,

(c) a phosphonic acid ester represent by the formula:



(3)

wherein R and R'' are independently a lower alkyl group; and n is zero or an integer of 1, provided that when n is 1, R'' is OH,

(B) an N,N'-ethylenebis acid amide represented by the formula:

$$R_5CONHCH_2CH_2NHCOR_5 \quad (4)$$

wherein R_5 is a saturated or unsaturated fatty acid residue having 12 to 22 carbon atoms, and having an average particle size of 1 μm or more in an amount of 2 to 15% by weight, and

(C) a lubricating oil having a viscosity of 5 CS or more at 40° C. in an amount to make the composition 100% by weight.

4,803,001

AMINOMETHYL DERIVATIVES OF BENZOTHIAZOLINETHIONE AS LUBRICANT ADDITIVES

Hugo Camenzind, Fribourg, Switzerland, and Emyr Phillips, Sale, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 866,189, May 22, 1986, Pat. No. 4,737,302. This application Jan. 6, 1988, Ser. No. 141,165

Claims priority, application Switzerland, May 23, 1985, 2199/85

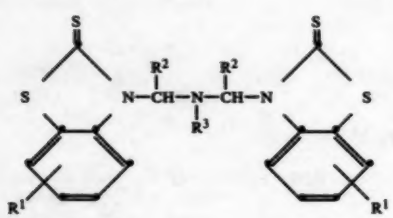
Int. Cl.[4] C10M *133/38*

U.S. Cl. 252—47 **11 Claims**

1. A lubricant composition stabilized to reduce friction, wear, corrosion and oxidation, which comprises

(a) one or more mineral oils or synthetic oils, and

(b) 0.05 to 5% by weight, based on the oil, of at least one compound of formula II



II

wherein

R^1 is hydrogen, C_1–C_{12}alkyl, C_2–C_4alkoxy, C_2–C_{24}alkoxycarbonyl or nitro,

R^2 is hydrogen, C_1–C_{12}alkyl, 2-furyl, phenyl or phenyl which is substituted by C_1–C_4alkyl, C_1–C_4alkoxy, C_2–C_4alkoxycarbonyl or nitro, and

R^3 is hydrogen, C_1–C_{20}alkyl, said alkyl interrupted by one or more members selected from O, S and N atoms or said alkyl containing oxo or thiono groups; or is C_3–C_{24}alkenyl, C_3–C_{12}alkoxyalkyl, C_5–C_8cycloalkyl, phenyl or phenyl which is substituted by C_1–C_{12}alkyl, C_1–C_4alkoxy, C_2–C_{24}alkoxycarbonyl or nitro; or is naphthyl, C_7–C_9phenylalkyl, 2-furylmethyl or 2-(tetrahydrofuryl)methyl.

4,803,002

CARBONATE TREATED DISPERSANTS

Robert H. Wollenberg, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 910,107, Sep. 19, 1986, Pat. No. 4,755,312, which is a division of Ser. No. 834,972, Feb. 28, 1986, Pat. No. 4,729,842, which is a division of Ser. No. 673,963, Nov. 21, 1984, Pat. No. 4,585,566. This application Apr. 21, 1988, Ser. No. 184,472

Int. Cl.[4] C10M *133/16*

U.S. Cl. 252—49.6 **20 Claims**

1. A product prepared by the process which comprises reacting at a temperature sufficient to cause reaction a dispersant borated Mannich base having at least one primary or secondary amine group with a cyclic carbonate and wherein the molar change of cyclic carbonate to the basic nitrogen of the borated Mannich base is from about 0.2:1 to about 10:1.

4,803,003

ETHYLENE COPOLYMER VISCOSITY INDEX IMPROVER DISPERSANT ADDITIVE USEFUL IN OIL COMPOSITIONS

David Y. Chung, Edison, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jun. 16, 1987, Ser. No. 63,144

Int. Cl.[4] C10M *105/22*

U.S. Cl. 252—51.5 A **18 Claims**

1. A composition useful as an oil additive comprising reaction product of:

(i) reaction product of

(a) oil soluble ethylene copolymer comprising from about 15 to 90 wt. % ethylene and about 10 to 85 wt. % of at least one C_3 to C_{28} alpha-olefin, said copolymer having a number average molecular weight within a range of about 10,000 to 500,000, grafted with ethylenically unsaturated carboxylic acid material having 1 to 2 carboxylic acid groups or anhydride group,

(b) at least one polyamine selected from the group consisting of poly(alkylene amines) and poly(oxyalkylene amines) having at least two primary amine groups, and

(c) at least one carboxylic acid material selected from long chain hydrocarbyl substituted succinic anhydride or acid having about 50 to 400 carbons in said hydrocarbyl; and

(ii) a viscosity stabilizing effective amount of at least one C_{12} to about C_{16} aliphatic hydrocarbyl substituted succinic anhydride

15. An oil soluble viscosity stabilized grafted ethylene copolymer useful as an oil additive prepared by a process comprising:

(i) forming a grafted ethylene-alpha-olefin copolymer by grafting (a) oil soluble ethylene copolymer comprising from about 15 to 90 wt. % ethylene and about 10 to 85 wt. % of at least one C_3 to C_{28} alpha-olefin, said copolymer having a number average molecular weight of from about 10,000 to 500,000, with (b) ethylenically unsaturated carboxylic acid material having 1 to 2 carboxylic acid groups or anhydride group,

(ii) admixing said grafted ethylene-alpha-olefin copolymer (i) with at least one carboxylic acid material selected from long chain hydrocarbyl substituted succinic anhydride or acid having about 50 to 400 carbons in said hydrocarbyl to form a reaction mixture,

(iii) reacting the reaction mixture of (i) and (ii) with at least one polyamine selected from the group consisting of poly-(alkylene amines) and poly(oxyalkylene amines) having at least two primary amine groups, and

(iv) subsequently reacting said reaction product of (i) through (iii) with an amount of at least one C_{12} to about C_{16} aliphatic hydrocarbyl substituted succinic anhydride effective to improve the viscosity stability thereof.

4,803,004

REACTION PRODUCTS OF ALKENYLSUCCINIC COMPOUNDS WITH AROMATIC AMINES AND HINDERED ALCOHOLS AND LUBRICANT COMPOSITIONS THEREOF

Harry J. Andress, Wenonoah, and Henry Ashjian, E. Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 19, 1985, Ser. No. 702,989

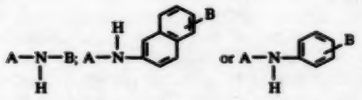
The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.

Int. Cl.[4] C10M *141/06, 141/06*

U.S. Cl. 252—51.5 A 30 Claims

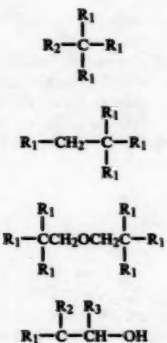
1. A product of reaction made by

(a) reacting an alkenylsuccinic compound selected from the group consisting of an alkenyl succinic acid and the ester and the anhydride thereof with an aromatic amine selected from the group having the following general formulae:



wherein A and B may be the same or a different aromatic group and wherein one or both of said aromatic groups may contain an alkyl substituent having from about 4 to about 18 carbon atoms and wherein said aromatic groups have from 6 to about 50 carbon atoms with

(b) a hindered alcohol selected from the group having the following general formulae:



(1)

(2)

(3)

(4)

wherein each R_1 and R_2 is each separately selected from CH_2OH and CH_3 with the proviso that at least one R_1 or R_2 is CH_2OH and R_3 is selected from H or alkyl of from about 4 to 22 carbon atoms and wherein reaction (a) is carried out at temperatures of from about 100°–200° C. and reaction (b) is carried out at temperatures of from about 100° to about 300° C. with the reactants being present in a molar ratio of succinic compound to aromatic amine to hindered alcohol of about 1:0.1–1:0.5–0.75.

4,803,005

PERFLUOROPOLYETHER SOLID FILLERS FOR LUBRICANTS

Timothy J. Juhlke; Thomas R. Bierschenk, both of Roundrock, and Richard J. Lagow, Austin, all of Tex., assignors to Exfluor Research Corporation, Austin, Tex.

Filed Aug. 6, 1986, Ser. No. 893,640

Int. Cl.[4] C10M *105/52*

U.S. Cl. 252—58 11 Claims

1. A lubricant comprising a perfluoropolyether oil and about 20–70 percent by weight perfluoropolyether solid as filler.

4,803,006

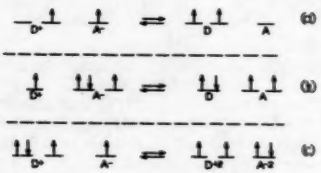
STRONGLY MAGNETIC ORGANIC SOLID STATE COMPOSITION OF MATTER

Long Y. Chiang, Somerset, and Aaron N. Bloch, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 853,661, Apr. 18, 1986, abandoned. This application Jun. 26, 1987, Ser. No. 66,704

Int. Cl.[4] H01F *1/00*

U.S. Cl. 252—62.51 10 Claims



1. A composition of matter having paramagnetic or ferromagnetic properties wherein said composition includes an aromatic organic donor molecule and an aromatic organic acceptor molecule one of which has a three-fold summetry, said donor molecule and acceptor molecule being stacked together, in a mix-stacked form and a dopant with an electron affinity so as to generate a ground state molecule with a triplet character.

7. A composition of matter comprising a donor molecule and an acceptor molecule, said donor molecule being selected from the group consisting of 2,3,6,7,10,11-hexaalkoxytriphenylene; 2,3,6,7,10,11-hexaaryloxytriphenylene; 2,3,6,7,10,11-hexa-p-alkylaryloxytriphenylene; 2,3,6,7,10,11-tris(N,N'-alkylenediamino) triphenylene; and hexaazaoctadecahydrocoronene, wherein said alkyl, alkoxy and alkanoate groups have from 1 to 13 carbon atoms therein, and said acceptor molecule is tetrafluorotetracyanoquinodimethane, said donor and acceptor molecule being present in a 1:1 ratio and in a mix-stacked form; and a dopant selected from the group consisting of halogen, AsF_5, SbF_5 or NO^+X^- is a univalent anion.

4,803,007

CORROSION INHIBITOR FOR SALT-BASED DEICING COMPOSITIONS

Frank R. Garber, 137 Canterbury Rd., Circle Pines, Minn. 55014

Filed Oct. 16, 1987, Ser. No. 109,486

Int. Cl.[4] C09K *3/18*

U.S. Cl. 252—70 11 Claims

1. A deicing composition consisting essentially of a mixture of a major amount of sodium chloride and a corrosion inhibitor comprising a source of water-soluble Zn^{+2} selected from the group consisting of zinc halide, zinc acetate, zinc nitrate, zinc oxide and zinc sulfate and a hexametaphosphate salt wherein said inhibitor is present in an amount effective to reduce the rate of corrosion of ferrous metals by aqueous sodium chloride solutions.

4,803,008

CLEANING COMPOSITION CONTAINING A COLORANT STABILIZED AGAINST FADING

Laura A. Ciolino, and Shaun F. Clancy, both of Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Sep. 23, 1987, Ser. No. 99,922

Int. Cl.[4] C09D 9/00; C11D 7/22, 7/50

U.S. Cl. 252—162 32 Claims

1. A cleaning composition comprising on a weight basis from about 2 to about 50% of a C_1-C_4 alkyl ether of alkylene and polyalkylene glycols, said glycol ethers having a total of from about 3 to about 12 carbons and introducing impurities into the composition in an amount and of a nature normally chemically incompatible with oxidizable dye chromophores; from about 0.0001 to about 0.1% by weight of a dye including oxidizable dye chromophores; from about 0.001 to about 0.1% by weight of an iodide salt stabilizer in an amount effective to retard fading of the dye; from about 0.001 to about 5% by weight of a surfactant; and water, said composition having a basic of neutral pH when the stabilizer is the thiosulfate salt.

4,803,009

STABILIZED AZEOTROPE OR AZEOTROPE-LIKE COMPOSITION OF 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, METHANOL AND 1,2-DICHLOROETHYLENE

Robert A. Gorski, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 2, 1988, Ser. No. 151,539

Int. Cl.[4] C11D 7/30, 7/50

U.S. Cl. 252—171 16 Claims

1. A stabilized azeotrope or azeotrope-like composition comprising a mixture of about 64 to 72 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane, about 5 to 7 weight percent methanol and about 23 to 29 weight percent trans-1,2-dichloroethylene and effective stabilizing amounts of a lower alkoxyphenol, 1,2-butylene oxide, diisopropylamine and at least one of nitromethane and 1,2-propylene oxide.

4,803,010

WATER-SOLUBLE VISCOSITY INCREASING AGENT AND DETERGENT COMPOSITION CONTAINING THE SAME

Hidekazu Ogino, Koutoubashi; Hiroshi Kamitani, Wakayama; Jun Kamegai, Ichikawa; Hiroki Sawada, Wakayama; Hajime Hirota, Tokyo, and Tomihiro Kurosaki, Sennan, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 8, 1987, Ser. No. 93,606

Claims priority, application Japan, Sep. 18, 1986, 61-220043; Sep. 18, 1986, 61-220044

Int. Cl.[4] C11D 1/72

U.S. Cl. 252—174.21 9 Claims

1. A water soluble viscosity increasing agent, consisting essentially of at least one α-branched fatty acid ester selected from the group consisting of:

(i) an ester of an adduct of 40 to 400 moles of ethylene oxide with one mole of a polyhydric alcohol and an α-branched fatty acid of 8 to 36 carbon atoms,

(ii) an ester of polyethylene glycol having an average molecular weight of 2000 to 20,000 and an α-branched fatty acid of 8 to 36 carbon atoms, and

(iii) an adduct of 40 to 400 mole of ethylene oxide with an ester of a polyhydric alcohol and an α-branched fatty acid of 8 to 36 carbon atoms.

4,803,011

ELECTRICALLY CONDUCTING FILMS COMPRISING AT LEAST ONE MONOMOLECULAR LAYER OF AN ORGANIC CHARGE TRANSFER COMPLEX

André Barraud, Bures sur Yvette; Annie Ruaudel, Verrieres le Buisson, and Michel Vandevyver, Chatenay Malabry, all of France, assignors to Commissariat a l'Energie' Atomique, Paris, France

Filed May 9, 1985, Ser. No. 732,413

Claims priority, application France, May 10, 1984, 84 07214

Int. Cl.[4] H01B 1/00

U.S. Cl. 252—500 18 Claims

1. An electrically-conducting film, which comprises at least one monomolecular layer of amphiphilic molecules of an organic charge transfer complex of the formula:

$$DA_xX_y$$

wherein:

D is at least one member selected from the group consisting of quaternary ammonium groups, quaternary ammonium groups derived from aniline, quaternary ammonium groups derived from substituted aniline derivatives, quaternary groups derived from pyridines, quaternary ammonium groups derived from pyridines, quaternary ammonium groups derived from bipyridines, quaternary ammonium groups derived from benzopyridines, N-alkylbenzothiazoles, substituted N-alkylbenzothiazole derivatives, N-alkyl-indoleninium trimethine cyanines, and substituted N-alkyl-indoleninium trimethine cyanine derivatives;

A represents an organic electron acceptor group selected from the group consisting of tetracyanoethylene (TCNE), hexacyanobutadiene (HCBD), 1,2,4,5-tetracyanobenzene (TCNB), 7,7,8,8-tetracyanoquinodimethane (TCNQ) and its substituted derivatives, tetracyanodiquinodimethane (TCNDQ), benzotetracyanoquinodimethane (benzo-TCNQ), 2,3,5,6-tetrachloro-p-benzoquinone (CA), trinitro-benzene (TNB), tetranaphthoquinodimethane (TNAP), thiophenetetracyanoquinodimethane (thiophen-TCNQ), selenophen-tetracyanoquinodimethane (selenophen-TCNQ), and tetracyanoquinoquinazoline (TCQQ);

X represents I^-, PF_6^-, ClO_4^-, ReO_4^-, IO_4^-, AsF_4^-, FSO_3^-, FSO_3^-, AsF_6^-, Br^-, Cl^- or $MnCl_6^-$;

x is a number greater than 0 and up to 20;

y is equal to 0, or a number greater than 0 and up to 20; and

wherein at least one of the groups D and A is amphiphilic and has a saturated or unsaturated hydrocarbon substituent with at least 16 carbon atoms and up to 30 carbon atoms.

2. The conducting film of claim 1, wherein the monomolecular layers are formed from at least two different conductive charge transfer complexes.

4,803,012

ETHOXYLATED AMINES AS SOLUTION PROMOTERS

Thomas Wershofen, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

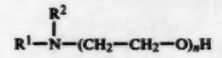
Filed Feb. 6, 1987, Ser. No. 12,102

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603579

Int. Cl.[4] C11D 3/30, 1/00

U.S. Cl. 252—544 7 Claims

1. A method for promoting the water solubility of detergent components in an aqueous concentrate wherein said detergent concentrate is formulated for the machine washing of bottles, comprising incorporating in said concentrate a solubility-promoting-effective amount of one or more ethoxylated fatty amines corresponding to the following general formula



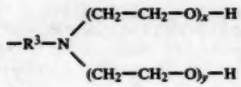
(I)

in which

n is an integer of from 2 to 30,

R^1 is a C_{8-24} straight-chain or branched-chain, saturated or unsaturated alkyl, and

R^2 has the formula



(III)

where

R^3 is a C_{2-6} alkylene, and

x, and y are each an integer of from 0 to 30.

4,803,013

HALOGENATED NAPHTHALENE DERIVATIVES

Nobuo Yokoyama, Musashino, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

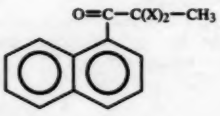
Filed Mar. 16, 1988, Ser. No. 169,221

Claims priority, application Japan, Mar. 17, 1987, 62-61788; Mar. 17, 1987, 62-61789

Int. Cl.[4] H01B *3/24*

U.S. Cl. 252—580 **14 Claims**

1. A naphthalene derivative of the formula



where X is a fluorine or bromine atom.

2. 2,2-Difluoro-1-(1-naphthyl)-1-propanone.

4,803,014

LIGHT-POLARIZING FILM

Takuzo Okumura, Tokyo; Toyokazu Okada, and Hitoshi Kikui, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

PCT No. PCT/JP86/00091, § 371 Date Sep. 8, 1986, § 102(e) Date Sep. 8, 1986, PCT Pub. No. WO86/04998, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 25, 1986, Ser. No. 910,220

Claims priority, application Japan, Feb. 26, 1985, 60-36855

Int. Cl.[4] G02B *5/30*

U.S. Cl. 252—585 **11 Claims**

1. A light-polarizing film exhibiting a neutral gray produced by adsorbing and orienting the following (A) and (B) and/or (C) as dichroic coloring matter in a polymer film:

(A) iodine,

(B) a dichroic dye having absorption characteristics and polarization characteristics in the wavelength region of 400–500 nm in the wavelength range of visible light,

(C) a dichroic dye having absorption characteristics and polarization characteristics in the wavelength region of 600–700 nm in the wavelength range of visible light.

4,803,015

CONTINUOUS PROCESS FOR THE PRODUCTION OF ACYLOXYBENZENESULFONIC ACIDS

Werner Wellbrock, Bad Soden am Taunus, and Adolf Studeneer, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 23, 1986, Ser. No. 922,275

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538141

Int. Cl.[4] C07C *143/90*

U.S. Cl. 260—402 **2 Claims**

1. A process for the continuous production of C_7–C_{12}-acyloxybenzenesulfonic acids, which comprises charging phenol and a sulfonating agent, diluted with an aliphatic C_7–C_{12}-carboxylic acid, to the top of a continuous-flow reactor heated to 80°–100° C. and charging the mixture of phenolsulfonic acid and the aliphatic carboxylic acid leaving the bottom end of this con- tinuous-flow reactor, and a chlorinating agent to the top of a second continuous-flow reactor heated to 45°–65° C., nitrogen being passed in counter-currnnt through both continuous-flow reactors.

4,803,016

METHOD OF DEOILING CRUDE LECITHIN

Melvin D. Binderman, Gaithersburg, Md., and Joseph N. Casey, Ft. Wayne, Ind., assignors to Central Soya Company, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 897,288, Aug. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 724,321, Apr. 17, 1985, abandoned. This application Feb. 11, 1988, Ser. No. 154,987

Int. Cl.[4] C07F *9/10*

U.S. Cl. 260—403 **8 Claims**

1. A method for the acetone deoiling of crude lecithin comprising providing a vertically-extending column having in progression from the top: an upper settling and removal section, a lecithin feed section, a contacting section, an acetone feed section and a bottom settling and removal section, said lecithin feed section and contacting section being equipped with vertically spaced apart agitators, the agitators only in said contacting section being separated by vertically-spaced apart, aperture-equipped annular baffles wherein the open area of each annular baffle is from about 20% to about 40% of the outside diameter of the baffle, treating said lecithin with from about 5% to about 20% acetone to facilitate break-up of solids during extraction and to increase flowability, introducing said treated lecithin into said feed section while introducing acetone into said acetone feed section, said lecithin introduction being under conditions of agitation but without flow constriction and at essentially atmospheric pressure, thereafter flowing said lecithin in continuous, countercurrent relation to acetone at a rate of 3 to 10 parts acetone to one part lecithin by weight under conditions of agitation and flow constriction to provide a refined lecithin having an Acetone Insolubles content in the range of about 94% to about 99.9%.

4,803,017

QUATERNARY AMMONIUM SALTS

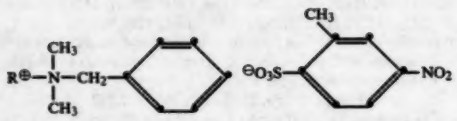
Douglas E. Bugner, and Peter S. Alexandrovich, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,488

Int. Cl.[4] C07C *87/30*; G03G *9/00*

U.S. Cl. 260—501.15 **2 Claims**

1. A quaternary ammonium salt having the structure



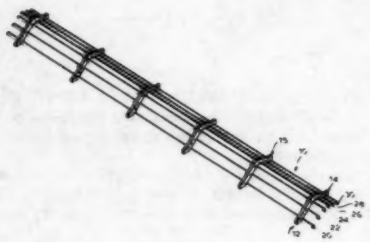
wherein R is alkyl having 12 to 18 carbon atoms.

4,803,018

SPLASH FILL FOR HEAT AND MASS TRANSFER APPARATUS AND METHOD OF MAKING A SPLASH FILL ASSEMBLY

Marcel R. Lefevre, 15990 Triple Crown Ct., Fort Myers, Fla. 33912, and Marven M. Smith, II, N. Ft. Myers, Fla., assignors to Marcel R. Lefevre, Fort Myers, Fla.

Filed Jul. 16, 1987, Ser. No. 74,337
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—111 11 Claims



1. A splash bar fill assembly for a splash-type cooling tower comprising at least two spaced-apart, vertically oriented, support assemblies laterlaly supporting a plurality of splash fill bars within the fill area of the tower, the splash fill bars comprising an elongated member having a generally convex upper surface of restricted width including first and second edges, the first and second edges having a pair of converging side surfaces which depend downwardly therefrom at an acute angle with respect to the upper surface, the side surfaces being of restricted depth; a crown formed at the uppermost point of the elongated member; and a vertical supporting rib member extending downwardly from the crown of the elongated member and having a lower free end which includes a bulbous formation formed thereon.

4,803,019

PROCESS FOR FORMING A LINER AND CAST PROPELLANT CHARGE IN A ROCKET MOTOR CASING

William H. Graham, Huntsville; Kenneth E. Bevel, Grant; James D. Byrd, Huntsville; Kenneth E. Junior, Madison, and Inella G. Shepard, Huntsville, all of Ala., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Feb. 10, 1984, Ser. No. 579,222
Int. Cl.[4] C06B *21/00*
U.S. Cl. 264—3.1 6 Claims

1. A process for lining a rocket motor and casting a propellant charge within and an interfacial contact with said lining, comprising the steps of:

a. providing a rocket casing having an internal surface;

b. providing a blocked curable liner composition which is the reaction product of a prepolymer, an isocyanate curing agent, and a blocking agent;

c. applying said liner composition to said internal surface, thereby forming a casing and uncured liner assembly;

d. providing an uncured, castable propellant composition;

e. preheating said assembly, thereby preparing it for receiving said propellant while simultaneously unblocking said liner and precuring said liner to a tacky state;

f. casting said propellant within said precured liner; and

g. cocuring said liner and propellant compositions.

4,803,020

PROCESS FOR RADIATION CURING OF EPDM ROOF SHEETING UTILIZING CROSSLINKING PROMOTERS

Joseph K. Valaitis, Brecksville, and James A. Davis, Uniontown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 2, 1987, Ser. No. 115,312
Int. Cl.[4] B29C *35/10*
U.S. Cl. 264—22 10 Claims

1. A process for preparing EPDM sheeting suitable for roofing purposes, said process comprising the steps of

(a) preparing a sheet having a thickness ranging from 10 to 150 mils composed of composition comprising (i) 100 parts uncured ethylene-propylene-diene (EPDM) elastomer containing an ethylene to propylene ratio ranging from about 3:1 to about 1:3, from about 2 to about 15 double bonds per 1000 carbon atoms and a number average molecular weight ranging from about 20,000 to about 200,000, (ii) from about 40 parts to about 150 parts carbon black, (iii) from about 30 parts to about 100 parts process oil and (iv) an amount of compatible radiation crosslinking promoter effective to promote curing in step (b), said radiation crosslinking promoter being selected from the group consisting of organic peroxides and liquid high vinyl 1,2-polybutadiene resin,

(b) treating said sheet with ionizing radiation to provide cured EPDM sheeting, said ionizing radiation being directed at both sides of the sheet.

4,803,021

ULTRAVIOLET LASER TREATING OF MOLDED SURFACES

Dennis L. Werth, Willow Springs, and Virupaksha K. Reddy, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 829,794, Feb. 14, 1986, abandoned. This application Apr. 3, 1987, Ser. No. 34,794
Int. Cl.[4] B29C *71/04*
U.S. Cl. 264—25 48 Claims

1. A treating process for the removal of a mold-release agent from the surface of a molded composition, comprising the steps of:

(a) introducing the molded composition having its surface coated with a thin film of the mold-release agent, into a treating zone, having a controlled atmosphere;

(b) irradiating the coated surface of the molded composition with ultraviolet radiation, said radiation having sufficient intensity to decompose said mold-release agent to yield diverse decomposition fragments within said treating zone;

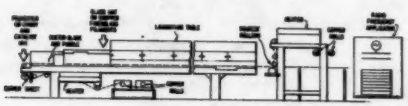
(c) removing the diverse fragments of said mold-release agent from said treating zone; and

(d) recovering from said treating zone a molded composition having a clean surface, substantially free of mold-release agent.

4,803,022
METHOD OF CONTINUOUSLY BONDING AND CURING A ZINC-COATED METAL-CLAD POLYESTER-EPOXY-GLASS FIBER LAMINATE

David Barrell, Temple City, Calif.; Gerald P. Griffith, Collierville, Tenn.; Donald E. Kennedy, Baldwin Park, and Donald C. Rollen, Railto, both of Calif., assignors to Glasteel Industrial Laminates, Inc., Collierville, Tenn.

Filed May 6, 1987, Ser. No. 46,354
Int. Cl.[4] B29C *35/14, 71/04*
U.S. Cl. 264—25 20 Claims



1. A continuous process for preparing a metal foil laminate having at least one sheet of zinc-coated metal foil directly bonded to a face of a sheet of a glass fiber reinforced polyester and epoxy resin, comprising:

applying a coating of a polyester and epoxy resin, said resin consisting essentially of from about 80% to about 90% by weight polyester and from about 10% to about 20% by weight epoxy, to a first zinc-coated metal foil;

uniformly distributing glass fiber on said polyester and epoxy resin coating;

heating said glass fiber containing polyester and epoxy resin coated metal foil to partially gel said resin;

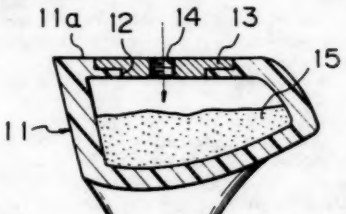
applying pressure to said partially gelled glass fiber containing polyester and epoxy resin coated metal foil; and

curing said glass fiber containing polyester and epoxy resin using radio-frequency electromagnetic energy to directly bond said glass fiber containing polyester and epoxy resin to said first zinc-coated metal foil.

4,803,023
METHOD FOR PRODUCING A WOOD-TYPE GOLF CLUB HEAD

Koichi Enomoto, and Tatsuo Nakanishi, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 739,029, May 29, 1968, abandoned. This application Feb. 19, 1987, Ser. No. 16,242
Claims priority, application Japan, Sep. 17, 1985, 60-205093
Int. Cl.[4] B29D *27/00*; A63B *53/04*
U.S. Cl. 264—45.4 5 Claims



1. Method for producing a wood-type golf club head comprising the steps of

preparing a FRP shell having a cavity and defining a bottom section,

forming a seat hole in said bottom section of said FRP shell,

securedly closing said seat hole with a support plate having a threaded through hole at the position of the center of gravity thereof,

infusing foamable resin into said cavity of said FRP shell via said threaded through hole,

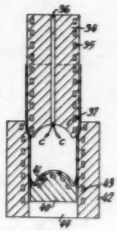
screwing a plug of a selected weight into said threaded through hole, and

developing foaming and hardening of said foamable resin for conversion into foam resin.

4,803,024
METHOD OF PRODUCING A CONTAINER

Torsten C. Nilsson, Löddeköpinge, Sweden, assignor to Petainer S.A., Neuchatel, Switzerland

PCT No. PCT/SE85/00253, § 371 Date Mar. 5, 1986, § 102(e) Date Mar. 5, 1986, PCT Pub. No. WO86/00565, PCT Pub. Date Jan. 30, 1986
PCT Filed Jun. 17, 1985, Ser. No. 847,902
Claims priority, application Sweden, Jul. 5, 1984, 8403569
Int. Cl.[4] B29C *35/02, 49/22, 55/26*
U.S. Cl. 264—80 15 Claims



1. A method of producing a container from a tubular blank having a closed bottom at one end and an open mouth at the other end, the blank consisting of plastic material capable of being deformed, said method comprising:

axially stretching a limited region of the wall of the tublular blank near said closed bottom end,

then circumferentially stretching a portion of the wall of the tubular blank which extends from the open mouth thereof while keeping the closed bottom and an adjacent portion of the wall unstretched,

then axially stretching said blank to produce axial orientation in the wall of said blank,

then supporting the tubular blank in an outer support member with the closed bottom of the tubular blank resting on a mold bottom member,

positioning a mandrel at the open mouth of the tubular blank, the mandrel having an outer diameter which is greater than the inner diameter of the tubular blank, and

producing relative movement between the mold bottom member, on the one hand, and the outer support member and mandrel, on the other hand, to force the tubular blank to expand on the mandrel and pass through a gap formed between the mandrel and the outer support member whereby to circumferentially expand the tubular blank to form the container.

4,803,025
CERAMIC FOAM

Jerry W. Brockmeyer, Hendersonville, N.C., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 23, 1984, Ser. No. 602,683
Int. Cl.[4] G04B *35/00, 35/10*
U.S. Cl. 264—63 6 Claims

1. A process for preparing a ceramic foam filter for filtering molten metal which comprises:

providing a reticulated, organic polymer foam; impregnating said foam with an aqueous slurry of a thixotropic ceramic composition including a phosphate binder in an amount of at least 8%; drying and heating said impregnated polymer foam to remove the organic component therefrom; and firing at an elevated temperature of at least

about 3020° F. to volatilize the phosphate producing a substantially phosphate-free material and sintering the refractory to produce a material having individual grains of ceramic tightly coalesced to minimize porosity between the grains, wherein the porosity between the grains is microporosity and the microporosity is less than about 5%.

4,803,026

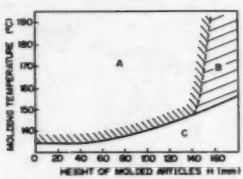
PROCESS FOR PREPARATION OF ACRYLIC RESIN SHEETS HAVING EXCELLENT MOLDABILITY AND SOLVENT RESISTANCE

Hiroyuki Ikeda; Yukihiro Matsumoto, both of Toyama, and Koyu Nishimura, Yokohama, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Oct. 3, 1986, Ser. No. 915,095

Int. Cl.[4] B29C *39/16*

U.S. Cl. 264—216 **6 Claims**



1. An improvement in a process for the preparation of acrylic resin sheets having excellent heat moldability and solvent resistance, wherein a syrup is prepared, which is composed of a partial polymerization product of methyl methacrylate or a monomer mixture comprising at least 60% by weight of methyl methacrylate and not more than 40% by weight of an acrylic acid ester, by partially polymerizing methyl methacrylate or said monomer mixture in the presence of a polymerization initiator; the thus-prepared syrup is incorporated with 0.02 to 1.0% by weight, based on the weight of the syrup, of a crosslinking agent; and the resulting mixture is subjected to cast polymerization in a casting mold; the improvement comprising carrying out the partial polymerization of the methyl methacrylate or said monomer mixture for the preparation of the syrup in the co-presence of 0.01 to 2.0% by weight, based on the weight of the methyl methacrylate or said monomer mixture, of a chain transfer agent, and carrying out the cast polymerization under such conditions that if the crosslinking agent is not present, the intrinsic viscosity of the completely polymerized sheet is in the range of 0.05 to 0.12 l/g.

4,803,027

PROCESS FOR THE PRODUCTION OF BIAXIALLY STRETCHED FILMS AND APPARATUS FOR IMPLEMENTATION OF THE PROCESS

Herbert Peiffer, Mainz; Guenther Crass, Taunusstein; Wolfgang Dietz, Saarbruecken, and Gunter Schloegl, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 9, 1987, Ser. No. 60,075

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1986, 3620219

Int. Cl.[4] B29C *47/88*

U.S. Cl. 264—210.5 **14 Claims**

1. A method for the production of biaxially stretched films having opposed roughened surfaces wherein the degree of roughness on the two film surfaces is reproducibly controlled with respect to each other, said method comprising the steps of:

extruding a plastic melt through a slot die to form a film;

depositing a roll side of the film onto a surface of a take-off roll, thereby defining an air side of the film opposite to the roll side;

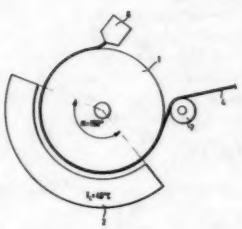
maintaining the surface of the take-off roll at a first temperature selected to provide a desired degree of surface roughness to the roll side of the film;

controlling the temperature of the air side of the film during at least a portion of said depositing step at a second temperature chosen in relation to said first temperature to provide a degree of roughness on the air side of the film having the desired relation to the degree of roughness on the roll side of film, said controlling step comprising exposing the film depositing over portions of the take-off roll surface on the air side of the film, which is opposite to the roll side of the film, to a rapid heat treatment of ambient air at an air temperature T_L greater than or equal to about 30° C. and less than or equal to about 200° C. for a period of time of at least 1.5 seconds sufficient to maintain said second temperature; and

biaxially stretching and heat-setting the film, whereby there is produced a film having the desired relation between the degree of roughness on both sides of the film.

10. An apparatus for producing biaxially stretched films having opposed roughened surfaces comprising:

means for extruding a plastic melt through a slot die to form a film having a roll side and an air side;



a take-off roll;

means for maintaining the surface of the take-off roll at a first temperature selected to provide a desired degree of surface roughness to the roll side of the film;

means for depositing the roll side of the film onto said take-off roll;

means for controlling the temperature of the air side of the film while it is at least on a portion of said take-off roll at a second temperature chosen in relation to said first temperature to provide a degree of roughness on the air side of the film having the desired relation to the degree of roughness on the roll side of the film, said controlling means including means for exposing the film deposited over at least a portion of the take-off roll surface on the air side of the film, which is opposite to the roll side of the film, to a rapid heat treatment of ambient air at an air temperature T_L greater than or equal to about 30° C. and less than or equal to about 200° C. for a period of time of at least about 1.5 seconds sufficient to maintain said second temperature, the means for exposing the film surface comprising a zone which surrounds a circumferential arc of the take-off roll of between about 150° and 200°; and

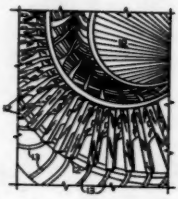
means for biaxially stretching the film.

4,803,028

CONDUCTOR INSULATING METHOD

Kevork A. Torosian, Schenectady; Ralph T. Heisler, Scotia, and Frederick E. Cox, Gloversville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 595,596, Apr. 2, 1984, Pat. No. 4,621,212.
This application Apr. 4, 1986, Ser. No. 848,429
Int. Cl.[4] B29C 45/14
U.S. Cl. 264—263 4 Claims



1. A method of electrically insulating a series loop of an electrical machine, in situ, comprising the steps of:

assembling a thermoplastic mold about the series loop which step includes partially overlapping the joined portions of two mold halves;

providing at least one non-hermetic seal at least at one end of the assembled mold between the mold and the series loop;

injecting a thermosetting resin into the mold; the thermosetting resin having a viscosity greater than 100,000 cps and the injection pressure being greater than 20 psig whereby air is expelled from the mold cavity through the non-hermetic seal without leaking the thermosetting resin;

curing the thermosetting resin at atmospheric pressure, in contact with both the series loop and the mold and thereby bonding the thermosetting resin to the mold whereby a composite electrical insulation is formed about the series loop without removing the mold.

4,803,029

PROCESS FOR MANUFACTURING AN EXPANDABLE MEMBER

Alfred A. Iversen, Wayzata, and William Eastman, Hopkins, both of Minn., assignors to PMT Corporation, Chanhassen, Minn.

Filed Jan. 28, 1986, Ser. No. 823,369
Int. Cl.[4] B29C 43/18
U.S. Cl. 264—264 3 Claims

1. Process for manufacturing an expandable member comprising the steps:

a. opening a mold with opposing like cavities and a port indentation;

b. positioning a first sheet of unvulcanized material in a first of said cavities;

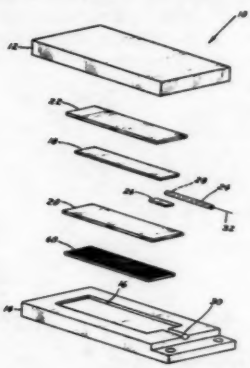
c. positioning at least one sheet of non-stick material of a smaller area size than said first sheet of unvulcanized material;

d. positioning a like sheet of unvulcanized material in the other of said cavities;

e. positioning a port tube in said port indentation in between said unvulcanized materials and adjacent said sheet of nonstick material;

f. positioning a flap of non-stick material over a port end of said tube;

g. closing said mold; and,



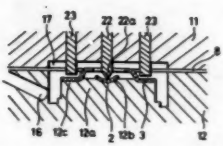
h. curing said unvulcanized material under pressure at an elevated temperature over time.

4,803,030

METHOD OF MOLDING CASE FOR PUSH-BUTTON SWITCH

Masato Kobayashi, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 24, 1987, Ser. No. 101,129
Claims priority, application Japan, Dec. 9, 1986, 61-293868; Dec. 9, 1986, 61-293867
Int. Cl.[4] B29C 45/14, 45/33
U.S. Cl. 264—278 2 Claims



1. A method of molding a case for use in a push-button switch, comprising the steps of:

preparing a contact plate having a central fixed contact and opposite fixed contacts;

preparing an upper die and a lower die one of which has a central support portion and opposite support portions;

mounting the contact plate between the upper and lower dies in such a way that respective contact surfaces on one side of the central fixed contact and the opposite fixed contacts bear against the central support portion and the opposite support portions, respectively;

moving a locating pin that has a tapered front end portion having a point through the other die and pressing the point of the pin against a holding surface on an opposite side from the contact surface of the central fixed contact;

moving other locating pins through said other die so that these pins protrude toward respective holding surfaces on the opposite sides from the contact surfaces of the opposite fixed contacts with slight gaps formed between ends of these pins and the respective holding surfaces;

injecting molten resin into a cavity formed between the dies so as to mold the central fixed contact and opposite fixed contacts in a molded switch body; and

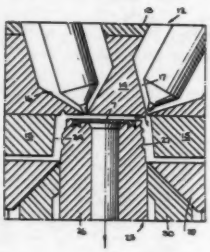
withdrawing the tapered locating pin and the other locating pins from the molded switch body and leaving a central tapered hole coming to a point at the holding surface of the central fixed contact, and opposite holes spaced by molded resin from the holding surfaces of the opposite fixed contacts by said slight gaps therebetween, which thereby do not allow solder flux to enter around said contacts.

4,803,031

METHOD AND APPARATUS FOR MOLDING A CLOSURE CAP

Charles S. Ochs, Lancaster, and Carl E. Koontz, Thornville, both of Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 384,185, Jun. 3, 1982, abandoned. This application Mar. 16, 1984, Ser. No. 590,153
Int. Cl.[4] B29C *45/16*; B29D *1/00*
U.S. Cl. 264—255 4 Claims



1. A method for molding generally cup-shaped plastic closures of one plastic material with interior molded container plastic sealing members of a differing plastic comprising the steps of holding two cooperating molding heads with communicating cavities in one position for injecting a first plastic into a first cavity defining the sealing members only, injecting the first plastic into said first cavity, providing relative movement between the molding heads forming a second cavity communicating with the plastic injected into said first cavity and defining a cup-shaped closure shell and injecting second plastic into the second cavity.

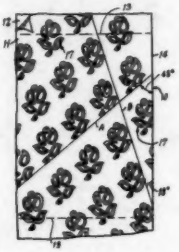
2. Apparatus for molding cup-shaped plastic closures of two or more plastic materials with an interior molded plastic elastomeric sealing member of one plastic material and a closure shell of a harder outer plastic material comprising a pair of molding heads each including molding dies, means for holding the heads in one relative position with a first cavity defining the elastomeric sealing member only, a plastic injector nozzle for elastomeric material positioned to communicate with said first cavity, means for moving said molding heads apart to a second position with the molding dies forming a second cavity communicating with said first cavity and defining the cup-shaped closure shells only, and a second plastic injection nozzle positioned to communicate with said second cavity to form the closure shell with an attached sealing member.

4,803,032

METHOD OF SPOT EMBOSSING A FIBROUS SHEET

Galyn A. Schulz, Appleton, Wis., assignor to James River-Norwalk, Inc., Norwalk, Conn.

Division of Ser. No. 494,685, May 17, 1983, Pat. No. 4,659,608, which is a continuation-in-part of Ser. No. 116,230, Jan. 28, 1980, abandoned, which is a continuation of Ser. No. 1,741, Jan. 8, 1979, abandoned. This application Jan. 21, 1987, Ser. No. 5,839
Int. Cl.[4] B29C *59/04*; B31F *1/07*
U.S. Cl. 264—284 3 Claims



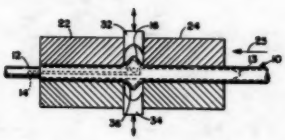
1. A method of embossing an absorbant multi-ply fibrous tissue product having a machine direction and a cross machine direction prior to winding into a roll in its machine direction which comprises passing the multi-ply web between an embossing roll provided with raised embossing elements made up of a plurality of closed curvilinear lands and a rubber back-up roll impressing the multi-ply web from one side only with a plurality of identical oriented uniformly spaced asymmetrical spot pattern embossments all of which are of identical size and shape and are arranged in a first and second series of parallel rows, said first series crossing said second series at an acute angle in the machine direction, with said first series of rows disposed at an angle of from about 40° to about 57° relative to the machine direction and said second series of rows disposed at an angle of from about 15° to about 23° relative to the machine direction and wherein the ratio of the transverse dimension across each boss and the spacing between parallel rows is between about 1.2 and about 6.5.

4,803,033

METHOD OF FORMING A FLANGE OR BELLOWS IN A PLASTIC TUB

William W. Rowley, 11524 Wilbert Rd., Chardon, Ohio 44024

Filed Apr. 15, 1987, Ser. No. 38,723
Int. Cl.[4] B29C *53/08*
U.S. Cl. 264—339 17 Claims



1. A method for forming a flange or bellows in a plastic tube comprising:

inserting a mandrel inside a plastic tube;

gripping said tube with at least two gripping dies, said gripping dies initially spaced apart;

heating the tube between the two gripping dies until the wall portion of said tube between said gripping dies is foldable,

moving said gripping dies relatively toward each other to form such flange or bellows;

controlling the extent of movement of such gripping dies so

as to avoid the interior walls of the flange or bellows from sticking to each other, and

providing the gripping dies with opposed annular ridges which are adapted to abut when the dies are moved toward each other.

4,803,034

CONCRETE FABRICATION AND CONCRETE SUCTIONING METHOD

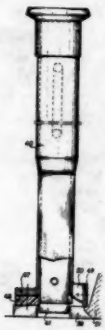
Willem Moret, Sliedrecht, Netherlands, assignor to Machinefabriek de Remise B.V., Netherlands

Continuation of Ser. No. 611,600, May 18, 1984, abandoned. This application Aug. 20, 1986, Ser. No. 879,209

Claims priority, application Fed. Rep. of Germany, May 19, 1983, 8301789

Int. Cl.[4] B28B *1/48, 11/12, 11/22;* **B65G** *53/00*

U.S. Cl. 264—504 **4 Claims**



1. A method of producing a concrete object comprising:

(a) first pouring an uncured concrete mixture into a mold; and

(b) then removing undesired uncured concrete by,

(1) providing a suctioning apparatus having a liquid supply means, a suction nozzle attached to a suction channel, and a tank connected to said channel,

(2) loosening and diluting concrete by means of liquid supplied through said liquid supply means, and

(3) suctioning said liquid and said loosened and diluted concrete together, through said suction nozzle, through said suction channel and into said tank, thereby removing said liquid and said loosened and diluted concrete.

4,803,035

METHOD FOR MAKING COMPOSITE FILMS

Edward N. Kresge, Watchung, and Donald R. Hazelton, Chatham Township, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 16, 1985, Ser. No. 809,511

Int. Cl.[4] B29C *47/78*

U.S. Cl. 264—519 **13 Claims**

1. A process for preparing a composite film comprising at least one layer of a first plastic polymer and a substrate of a second polymer/first plastic polymer composition wherein the plastic polymer has a semicrystalline or crystalline melting point which is at least 10° C. higher than the second polymer softening or melting point, said first plastic polymer comprising about 15 to about 90 weight percent of the second polymer/first plastic polymer composition said second polymer and plastic polymer being insoluble in one another, which comprises:

(a) intimately mixing the second polymer and first plastic polymer;

(b) extruding the mixture through a film die having a die outlet comprising a first die surface and a second die surface;

(c) cooling at least one surface of the die outlet to a temperature at least about 10° C. below the melting point of the plastic polymer; and

(d) cooling the film so formed.

4,803,036

PROCESS FOR BLOW-MOLDING AND HEAT SETTING OF POLYESTER HOLLOW FORMED BODY

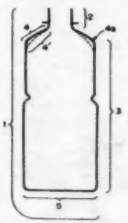
Yoshitsugu Maruhashi; Setsuko Iida; Takashi Sugisaki, all of Yokohama; Yohji Mizutani, and Nobuhiro Kishida, both of Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Aug. 31, 1987, Ser. No. 91,137

Claims priority, application Japan, Aug. 30, 1986, 61-202640

Int. Cl.[4] B29C *49/16*

U.S. Cl. 264—526 **6 Claims**



2. A process for the preparation of a heat resistant polyester hollow formed body, which comprises mounting a preform of a thermoplastic polyester material composed mainly of ethylene terephthalate units, which is maintained at a temperature where high-speed drawing is possible but whitening can be prevented, in a hollow forming mold maintained at a temperature as high as possible within the range where a final hollow formed body can be withdrawn without deformation substantially under non-cooling; blowing air maintained at a temperature of at least 10° C. higher than the preform temperature (T) into the preform to effect stretch drawing and expansion draiwng so that the drawing speed in the circumferential direction is at least 450%/sec and the drawing speed in the axial direction is at least 250%/sec, said high speed drawing of the preform causing the temperature of the preform to rise due to heat generated by internal friction or crystallization of the polyester material during said blowing step thereby effecting heat setting as the preform is being draw formed.

4,803,037

PIPE QUENCHING APPARATUS

Robert M. McBain; Garry J. Becze, both of Sault Ste. Marie; Friedrich W. Kruppert, Goulais River, all of Canada, and Jack W. Leistner, Greenville, S.C., assignors to The Algoma Steel Corporation, Limited, Sault Ste. Marie, Canada

Filed Jul. 24, 1987, Ser. No. 77,595

Int. Cl.[4] C21D *9/08*

U.S. Cl. 266—78 **10 Claims**

1. Apparatus for hardening an elongated steel pipe section by quenching with a liquid cooling medium, comprising in combination:

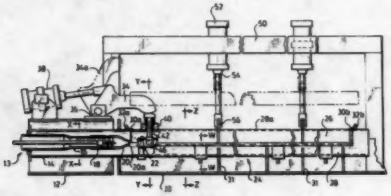
(a) a source of liquid cooling medium;

(b) a hollow elongated enclosure of length greater than the length of a pipe section to be quenched and of inside transverse dimensions greater than the outside diameter of such pipe section, and openable to receive such length of pipe, said enclosure comprising an upper shell and a lower shell operable to be assembled in mating engagement to form an enclosure and operable to be separated into an

open configuation in which one shell is displaced from the other a sufficient distance to facilitate the introduction of a pipe into the apparatus;

(c) injection means for introducing cooling medium from said source to flow through the interior of a pipe section supported within said enclosure in linear alignment with said injection means, and to flow over the outside surface of such aligned pipe section over the outside surface thereof through the space between the exterior of such aligned pipe section and the interior surface of said enclosure;

(d) supporting means operable to support such pipe section within said enclosure in axial alignment with said injection means, said supporting means comprising a plurality of longitudinally spaced transversely extending adjustable flexible members dimensioned and arranged as to permit a substantially unimpeded flow of cooling medium through said elongated enclosure and being adjustable in length so as to support pipe sections of various diameters in alignment with said injection means;



(e) means for regulating the rate of flow of cooling medium through the inside of a pipe section received in said enclosure in axial alignment with said injection means, relative to the rate of flow of cooling medium over the outside surface of such pipe section;

(f) pipe handling means for receiving a hot pipe section to be quenched and for depositing such pipe onto said supporting means with said enclosure in the open configuration, wherein said pipe handling means is adapted to retract from said supporting means to a position in close proximity to the inner surface of said lower shell when said upper and lower shells are assembled to form said enclosure, thereby leaving such pipe section supported on said supporting means, and for lifting said pipe section free of said enclosure when said upper and lower shells are separated into said open configuration; and

(g) securing means for securing a pipe section supported on said supporting means within said enclosure against longitudinal displacement by cooling medium introduced into said enclosure by said injection means.

4,803,038

INTERNAL ANTI-POPPING ASSEMBLY FOR SOLID PROPELLANT ROCKET MOTOR AND ITS MANUFACTURING PROCESS

Jean Beboux, Bordeaux, France, assignor to Societe Europeenne de Propulsion, France

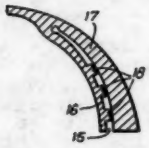
Division of Ser. No. 938,066, Dec. 4, 1986. This application Jan. 21, 1988, Ser. No. 146,385

Claims priority, application France, Dec. 5, 1985, 85 18021

Int. Cl.[4] C06B *21/00*

U.S. Cl. 264—3.3 **5 Claims**

1. A process for producing an internal anti-popping assembly for a solid propellant rocket comprising a propellant grain block housed in a casing with a heat-protection layer interposed between the propellant grain and the casing, and defining a combustion chamber, a separation zone formed between the propellant grain and the heat-protection layer of a bottom structure of the rocket, by a skin detached from said heat-protection layer and adhering to the solid grain, and means providing a passage for gases from the combustion chamber into the separation zone, wherein said process comprises the step of molding projections or teeth in one piece with one at least of



the two parts constituted by the detached skin and the heat-protection layer of the rocket motor bottom structure to ensure a minimum spacing of the detached skin with respect to said layer.

4,803,039

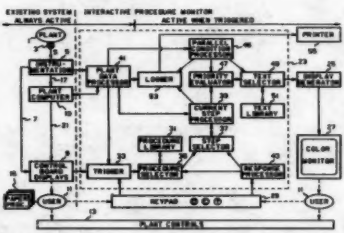
ON LINE INTERACTIVE MONITORING OF THE EXECUTION OF PROCESS OPERATING PROCEDURES

Albert J. Impink, Jr., Murrysville Boro; Melvin H. Lipner, Monroeville, and Roger A. Mundy, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 3, 1986, Ser. No. 825,427

Int. Cl.[4] G21C *7/36*

U.S. Cl. 376—216 **43 Claims**



1. A method of on-line monitoring of the execution by a human operator of procedures for a complex process facility comprising the steps of:

storing electric signals representative of step by step procedures for the complex process facility, at least some steps of which require verification of a selected process condition;

generating parameter signals representaitve of the real time value of predetermined process parameters;

sequentially electrically selecting a step of one of said stored step by step procedures as a current step;

electrically processing selected parameter signals to determine the state of the process condition to be varied by a current step which requires verification;

generating a visual representation of said current step including a visible textual statemenet of the condition to be verified, a visual indication of the state of the selected process condition to be verified by the current step, and, where the state of the selected condition indicates that it is not verified, a visible textual statement of recommended operator action;

providing means for the operator to electrically generate an operator response signal in response to a textural statement of recommended operator action by said visal display of said current step, including providing means for the operator to select between electrically generating an action complete response signal and an override response signal, and

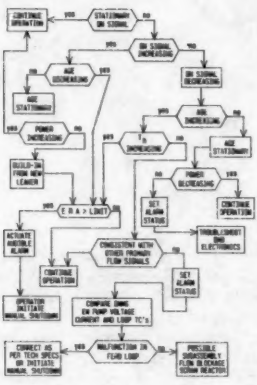
electrically sequentially selecting the next step in said stored procedure as the current step in response to said operator response siganl.

4,803,040

EXPERT SYSTEM FOR SURVEILLANCE AND DIAGNOSIS OF BREACH FUEL ELEMENTS

Kenny C. Gross, Lemont, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 21, 1988, Ser. No. 146,559
Int. Cl.[4] G21C *7/36*
U.S. Cl. 376—216 15 Claims



1. In a nuclear reactor having a core comprised of a plurality of cladded fuel elements, a coolant having a primary flow through the core over said cladded fuel elements, said fuel elements including fissionable fuel which emits delayed-neutrons (DN) as part of a nuclear chain reaction, a breached fuel element diagnostic apparatus comprising:

monitoring means for measuring the coolant primary flow rate and reactor power and generating output signals in response thereto;

delayed-neutron monitoring system (DNMS) means for measuring the equivalent recoil area (ERA) of a breach in the cladding of said fuel elements and for continuously monitoring the DN age and DN activity and generating output signals in response thereto, said DN age comprising the sum of a transit time, T_D, and hold-up time, T_h;

operability validation means for testing the operability of the components of said DNMS means and generating output signals indicating the operability of said components; and

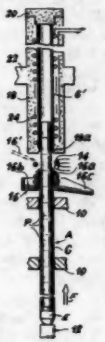
a knowledge system comprising a factual knowledge base, a judgment knowledge base and means for said judgmental knowledge base to access said factual knowledge base, said judgmental knowledge base receiving, as input signals, the output signals from said monitoring means, DNMS means and operability validation means, said judgmental knowledge base comprising means for determining the operability of said reactor from a predetermined combination of judgmental knowledge base input signals, said predetermined combination accounting for a nonconstant DN age, and generating output signals in response thereto.

4,803,041

PROCESS FOR THE RECYCLING OF NUCLEAR FUEL PELLETS PREVIOUSLY IRRADIATED IN A FAST NEUTRON NUCLEAR REACTOR

Jean-Pierre Marcon, Lyon, France, assignor to Novatome, Courbevoie, France

Filed Nov. 6, 1986, Ser. No. 927,757
Claims priority, application France, Nov. 8, 1985, 8516577
Int. Cl.[4] G21C *19/34, 21/08*
U.S. Cl. 376—261 7 Claims



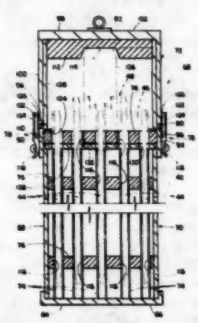
1. A process for the recycling of nuclear fuel pellets contained in a first metal can in which these pellets and said first metal can have previously been irradiated in a fast neutron nuclear reactor, wherein the process comprises extracting the pellets from the first irradiated can and introducing these pellets into a second unirradiated metal can before irradiating again said pellets contained in said unirradiated second metal can in a fast neutron reactor, said unirradiated metal can having a larger internal diameter than the internal diameter of the first can when said first can was in an unirradiated state, wherein the pellets are extracted from the first can by progressively melting the first can from one of its ends, the thus exposed pellets being maintained in their orientation and position in the stack and then being immediately introduced into the new can.

4,803,042

NUCLEAR REACTOR CORE COMPONENT SHIPPING CONTAINER

Charles B. Gilmore, Columbia, S.C.; James L. Kisak, Plum Boro, Pa.; Jeffrey P. Oberst, Penn Hills Twp., Pa.; John D. Wood, Hempfield Twp., Pa., and Frank J. Baloh, Dawson, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1987, Ser. No. 124,318
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—272 30 Claims



23. In combination with a nuclear core component assembly having a common mounting structure and a plurality of spaced

elongated members supported by said common structure and extending therefrom in a common direction, a nuclear core component shipping container comprising:

(a) a rigid cylinder body of plastic material having a closed bottom and an open top and receiving therein said elongated members of said nuclear core component assembly;

(b) a plurality of elongated tubes of plastic material inserted in said body and receiving said elongated members of said nuclear core component assembly, said tubes stabilizing said members during transport of said container with said core component assembly therein;

(c) a plurality of rigid flat cylindrical spacer plates of foam plastic material disposed stationarily within and transversely across said body and spaced apart from one another axially along said body, each of said plates having a plurality of openings therethrough receiving and disposing said tubes in transverse side-by-side spaced relationship with respect to one another in, and extending between said closed bottom and open top of, said body, said plates laterally spacing and supporting said core component members received in said tubes;

(d) a rigid cylindrical end lid composed of plastic material having a closed top and an open bottom and being installable at its open bottom on said open top of said body, said lid being hollow for receiving therein said common mounting structure of said core component assemby when said lid is installed on said body;

(e) locking means on said lid and said body and being actuatable for latching and unlatching said lid to and from said body; and

(f) a sealing element disposable between said open bottom of said lid and said open top of said body for providing an air-tight seal between said body and lid upon latching said lid to said body by actuation of said locking means.

4,803,043

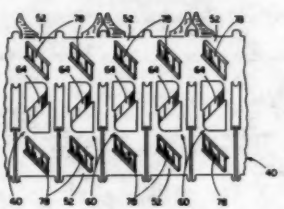
NUCLEAR FUEL ROD GRID SPRING AND DIMPLE STRUCTURES

Edmund E. DeMario, Columbia, and Bobby D. Street, West Columbia, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 53,990, May 22, 1987, abandoned. This application Nov. 25, 1987, Ser. No. 125,514

Int. Cl.[4] G21C *3/34*

U.S. Cl. 376—442 **30 Claims**



1. In a nuclear fuel rod grid including a plurality of inner and outer straps being interleaved with one another to form a matrix of hollow cells, each cell for receiving one fuel rod and being defined by pairs of opposing wall sections of said straps which wall sections are shared with adjacent cells, each cell having a central longitudinal axis, a fuel rod engaging spring structure of resiliently yieldable material being integrally formed on each wall section of said inner straps comprising:

(a) a pair of laterally spaced elongated leg members each having a pair of opposite ends only at which is anchored to said wall section; and

(b) an elongated cross member having a pair of opposite ends, said cross member extending diagonally between and integrally attached at its opposite ends to said leg members such that said spring structure formed by said leg and cross members has an effective length greater than the actual length it occupies on said wall section.

4,803,044

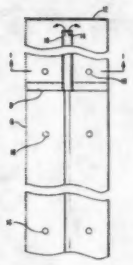
BWR ASSEMBLY

John F. Patterson, Richland, Wash., assignor to Advanced Nuclear Fuels Corporation, Richland, Wash.

Continuation-in-part of Ser. No. 850,104, Apr. 10, 1986, Pat. No. 4,708,846. This application Nov. 3, 1987, Ser. No. 116,606

Int. Cl.[4] G21C *3/32*

U.S. Cl. 376—444 **7 Claims**



1. A fuel assembly for a boiling water reactor comprising a group of vertical, parallel, elongated fuel rods containing a fissionable material, and an outer flow channel surrounding said fuel rods, said assembly having a critical heat transfer zone in its upper portion; at least one inner flow channel having substantially rectilinear sides spanning at least several fuel tubes, said inner channel being constructed and arranged to receive cooling water near the lower end of said assembly, said inner channel extending upwardly through said assembly parallel to said fuel rods and closed at its upper end; a closure in the upper portion of said inner channel; an inner tube having an opening through said closure, and an opening adjacent to the top of said inner channel; at least one opening in said central tube, adjacent said closure, and upper openings in said inner channel above said closure, and located within said critical heat flux zone, whereby cooling water will flow upwardly through said inner channel, upwardly through said inner tube, then downwardly through said inner channel and outwardly through said upper openings into the critical heat flux zone.

4,803,045

COBALT-FREE, IRON-BASE HARDFACING ALLOYS

Evan K. Ohriner, Hamden, Conn.; Edward P. Whelan; Tsuguyasu Wada, both of Ann Arbor, Mich., and Howard Ocken, Palo Alto, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 24, 1986, Ser. No. 922,528

Int. Cl.[4] C22C *38/44, 38/34, 38/38*

U.S. Cl. 420—57 **16 Claims**

1. A cobalt-free, wear-resistant and anti-galling hardfacing weld-consumble or cast alloy consisting essentially by weight of 0.85–1.4% carbon; 5.0–13.0% manganese; 1.5–5.5% silicon; 18.0–27.0% chromium; 4.0–12.0% nickel; an effective amount up to 6.0molybdenum to provide solid solution strengthening

with carbon molybdenum; 0.1–0.3% nitrogen; 0–1.0% niobium; 0–1.0% titanium; 0–1.0% tantalum; and the balance iron;

said alloy having a microstructure consisting essentially an austenitic matrix and eutectic alloy carbides.

4,803,046

METHOD FOR MAKING TARGETS

Juergen Hausselt; Stephan-U. Schittny, both of Alzenau, and Dieter Kaufmann, Birstein, all of Fed. Rep. of Germany, assignors to Demetron Gesellschaft Fuer Elektronik-Werkstoffe m.b.H., Hanau, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,502

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 3627775

Int. Cl.⁴ B22F *3/26*

U.S. Cl. 420—83 **14 Claims**

1. A method for making a high-purity, high density and mechanically-strong target, adapted for use to coat an object by cathode sputtering or by evaporation, comprising:

selecting a desired composition for said final target from a plurality of components, some of said components having a relatively higher melting temperature and some of said components having a relatively lower melting temperature;

forming a porous body of relatively high melting point from at least a portion of said components having a relatively higher melting temperature;

forming an impregnation material of relatively low melting point from the remaining portion of said components;

impregnating said porous body with said impregnation material such that the reaction of said impregnation material with said porous body produces no substantial amounts of a phase having a melting point lower than said components and produces only negligible proportions of a phase having brittleness in the equilibrium state.

4,803,047

METHOD FOR NEUTRALIZING OFFENSIVE CHEMICALS

Arthur W. Pluim, Jr., 324 E. Hazel, Stillwater, Minn. 55082

Continuation-in-part of Ser. No. 870,639, Jun. 4, 1986, which is a continuation-in-part of Ser. No. 589,595, Mar. 14, 1984, Pat. No. 4,594,239. This application May 28, 1987, Ser. No. 54,960

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.⁴ A61L *9/01*; A61K *7/135*

U.S. Cl. 422—5 **10 Claims**

1. A method for decontaminating a surface which has been exposed to a urushiol, said method being for the purpose of neutralizing said urushiol, wherein said method comprises contacting said urushiol with an effective amount of an aqueous solution of a chlorine-containing compound which is capable of reacting with said urushiol to produce non-allergic reaction products, wherein said chlorine-containing compound is a water-soluble compound which is a stable solid at room temperature.

4,803,048

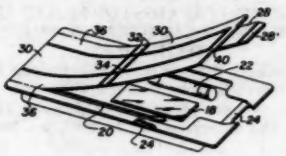
LABORATORY KIT

Frederic L. Nason, 6830 Orion Ave., Van Nuys, Calif. 91406

Filed Apr. 2, 1987, Ser. No. 33,220

Int. Cl.⁴ G01N *1/10, 33/48*

U.S. Cl. 422—58 **18 Claims**



1. A laboratory kit, comprising:

at least one laboratory implement;

a tray defining an upwardly open receptacle for receiving and storing said implement for use in performing a laboratory procedure; and

a cover affixed to said tray for closing said tray and preventing access to the implement therein, said cover including a tear-off portion separable from said tray to open the tray and expose the implement therein for use in performing the laboratory procedure, said tear-off portion having a plurality of score lines preformed therein and being foldable along said score lines to form a relatively compact package for receiving and protecting the implement subsequent to performance of the laboratory procedure.

4,803,049

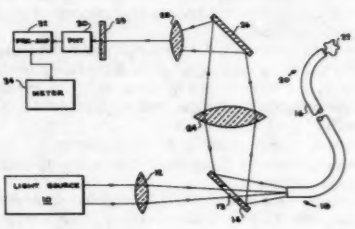
PH-SENSITIVE OPTRODE

Tomas B. Hirschfeld, Livermore, and Francis T. Wang, Danville, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 12, 1984, Ser. No. 681,487

Int. Cl.⁴ G01N *21/80, 33/49*

U.S. Cl. 422—58 **44 Claims**



1. An apparatus for monitoring the pH of an associated fluid, the apparatus comprising:

a light source for generating an illumination beam;

a support material having a surface, the surface being capable of contacting the associated fluid;

a first plurality of rhodamine or fluorescein dye molecules covalently attached to the surface of the support material, the attached rhodamine or fluorescein dye molecules of the first plurality being spaced on the surface of the support material so that dimers are not formed between the attached rhodamine or fluorescein dye molecules of the first plurality and adjacent attached rhodamine or fluorescein dye molecules, and the first plurality comprising a sufficient number of attached rhodamine or fluorescein dye molecules so that a fluorescent signal is generated whenever the attached rhodamine or fluorescein dye

molecules of the first plurality are illuminated by the illumination beam; and

detection means for detecting the fluorescent signal and for relating the intensity thereof to the pH of the associated fluid.

4,803,050

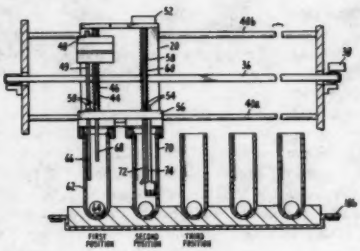
METHOD AND APPARATUS FOR LIQUID ADDITION AND ASPIRATION IN AUTOMATED IMMUNOASSAY TECHNIQUES

Daniel R. Mack, Half Moon Bay, Calif., assignor to Sequoia-Turner Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 757,525, Jul. 22, 1985, abandoned. This application Jul. 22, 1986, Ser. No. 888,848

Int. Cl.[4] G01N *35/06*

U.S. Cl. 422—65 **6 Claims**



1. A method for adding liquid to, and aspirating liquids from, reaction tubes disposed in rack comprising the steps of: providing reaction tubes disposed in a rack, said rack having n rows in a first horizontal x-direction and m columns in a second horizontal y-direction, perpendicular to the x-direction; a liquid probe depended from a carriage above said rack of tubes, said probe selectively moveable along its longitudinal axis relative to said carriage and perpendicular to the rack horizontal plane; means for moving said carriage in the x-direction or y-direction; means for selectively registering the liquid probe with a row of tubes in said rack; and, control means for selecting and effecting absolute and relative movement of the carriage, probe and rack;

introducing a controlled, timed, tube-dependent pause in a sequence for adding liquid to, and aspirating liquid from, a rack of reaction tubes by controlling the carriage and liquid probe movement so that

for each of y=1 to m columns,

a. liquid is added to tube in x row, y column;

b. previously-added liquid from tube in (x−1) row, y column is aspirated;

c. carriage, rack and probe are returned to register said probe with the tube in x row, (y+1) column; wherein x is between 1 and n.

4,803,051

ATOMIC SPECTROMETER APPARATUS

Gunter Knapp, Graz, Austria, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Continuation of Ser. No. 472,394, Mar. 4, 1983, abandoned, which is a continuation of Ser. No. 320,626, Nov. 12, 1981, abandoned. This application May 23, 1986, Ser. No. 868,204

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1980, 3042907

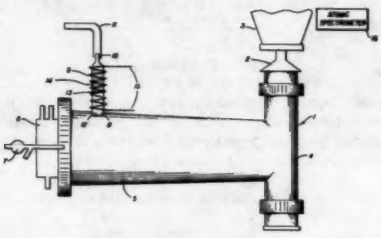
Int. Cl.[4] G01N *21/72*

U.S. Cl. 422—80 **12 Claims**

1. In combination, an atomic spectrometer and an atomizer apparatus for atomizing a test sample into an atomic state for analysis in said atomic spectrometer, wherein said atomic spectrometer is operatively connected to said atomizer apparatus such that said atomic spectrometer is capable of analyzing an atomized test sample produced by said atomizer apparatus, and wherein said atomizer apparatus comprises:

means for heating a sample to free individual atoms thereof for atomic spectroscopy, said heating means having an inlet opening for connection to a tube member for inletting a sample into said heating means;

a tube member containing a packing of an adsorbent for adsorbing predetermined metal complexes which adsorb to the adsorbent at a first temperature and are volatile at a second higher temperature for desorption from said adsorbent, said tube member having an inlet port for introducing a sample to said adsorbent, an outlet port connected to the inlet opening of the heating means and means for connecting the tube member to a source of carrier gas for carrying metal complexes desorbed from the adsorbent to the heating means;



a reagent for reacting with a selective metal constituent of a sample to form a predetermined metal complex which adsorbs to the adsorbent at a first temperature and is volatile at a second higher temperature for desorption from said adsorbent, wherein said reagent is adsorbed on said adsorbent in said tube member so that a sample may be introduced to said adsorbent to form metal complexes with said reagent; and

tube heating means disposed about said tube member for selectively heating said packing and any adsorbed metal complexes thereat to a temperature to desorb any such metal complexes therefrom for entraining into a flow of carrier gas through said tube member to said heating means for atomization thereof.

4,803,052

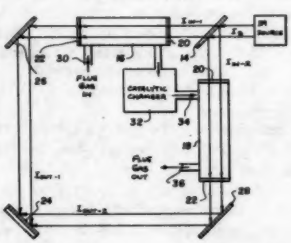
CARBON MONOXIDE DETECTOR

Andre T. Abromaitis, Northbrook, Ill., and Marion A. Keyes, IV, Chagrin Falls, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 431,430, Sep. 30, 1982. This application May 2, 1985, Ser. No. 729,889

Int. Cl.[4] G01N *21/05*

U.S. Cl. 422—91 **6 Claims**



1. A CO detector for determining the CO concentration in a

continuous test gas stream containing interfering or background gases comprising;

a single source of substantially monochromatic IR radiation;

a measuring chamber adapted to continuously receive a gas to be tested for CO;

a reaction chamber connected to said measuring chamber for continuously receiving gas from said measuring chamber and for converting substantially all CO in the sample stream to CO_2;

a reference chamber connected to said reaction chamber for continuously receiving a gas from said reaction chamber to be tested for CO;

said measuring and reference chambers having IR transparent means defining first and second IR radiation paths therethrough;

beam splitting means associated with said IR source for directing IR radiation along said first and second paths;

an IR detector for detecting IR radiation of said first and second paths after the IR radiation has passed through said measuring and reference chambers respectively; and

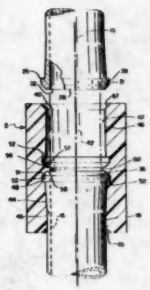
circuit means connected to said detector for continuously determing a difference between the IR radiation of said first and second paths absorbed in said measuring and reference chambers which difference is a function of the CO concentration of gas supplied to said measuring chamber.

4,803,053

LABORATORY GLASSWARE EQUIPMENT

Kenneth L. Williamson, 43 Woodbridge St., South Hadley, Mass. 01075

Filed Jan. 22, 1987, Ser. No. 6,018
Int. Cl.[4] B01L *3/00, 9/06*
U.S. Cl. 422—101 **22 Claims**



1. Laboratory equipment comprising:

two functional members each having an identical tubular conduit portion;

the tubular conduit portion having a central axis and a smooth uninterrupted interior surface defined by a substantially constant inner diameter so as to form a nonrestricted internal passageway about the central axis, the tubular conduit portion further having an end terminating to form a planar opening with male sealing means adjacent the planar opening, said male sealing means comprising an annular flange having a forward conical surface increasing in diameter from the planar opening and the flange forming a rearward shoulder that defines a surface symmetrical about said axis and with a cone angle plus or minus 10° relative to a plane perpendicular to said central axis, the radially outward portion of said shoulder terminating in a sharp circumferential edge defined by said symmetrical surface and a cylindrical surface of said male joint means and

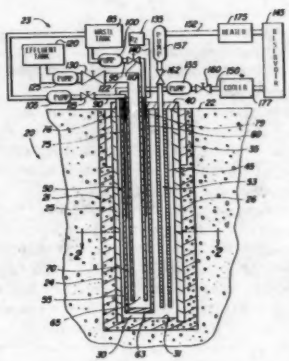
a coupling member having bore means comprising means defining a first and a second bore each having a first and a second end, the first and second bores being aligned about a central axis, the second end of the first bore opposing the second end of the second bore, the first and second bores each terminating in a coupling member opening at the first end and in stop means comprising seating members having means defining a central hole and an annular planar surface which cooperates and is coextensive with the planar opening of the tubular conduit portion, and the seating members comprise a gasket having means defining a central hole, the diameter of the hole substantially corresponding to the inner diameter of the tubular conduit portions and the gasket having a cross-sectional depth of 0.5 to 3 millimeters, the stop means adjoining female sealing means, each female sealing means comprising an annular groove having a forward conical surface increasing in diameter toward the opening and a rearward shoulder engaging said rearward shoulder on said male sealing means so that the female sealing means substantially corresponds to the male sealing means and cooperates with the male sealing means to support the functional members in axial alignment and to form a seal and the rearward shoulders of the male and female sealing means cooperating to resist an axial force tending to urge the tubular conduit portion out of the coupling member.

4,803,054

ASYMMETRIC HEAT-EXCHANGE REACTION APPARATUS FOR EFFECTING CHEMICAL REACTIONS

Dean R. Sillerud, Englewood, and Hermann W. Peterscheck, Longmont, both of Colo., assignors to VerTech Treatment Systems, Inc., Denver, Colo.

Filed Mar. 13, 1987, Ser. No. 25,470
Int. Cl.[4] B01J *10/00*
U.S. Cl. 422—109 **15 Claims**



1. A reaction apparatus for effecting chemical reactions, comprising:

means for holding a heat exchange medium, said holding means including a well casing lining a vertical subterranean shaft, said well casing defining an elongated chamber, said chamber having an upper portion and a lower portion;

a thermally insulated elongated conduit disposed in said elongated chamber and extending into and open to said lower portion of said elongated chamber for conveying a heat exchange medium into said elongated chamber;

an elongated reaction vessel disposed in said elongated chamber and spaced from said thermally insulated elongated conduit, said reaction vessel having first and second pipe portions defining first and second communicating flow passages, said first and second flow passages being in heat exchange relation to one another;

means for introducing a fluid containing at least two reactants into said elongated reaction vessel to form a fluid column having a reaction zone at a selected pressure; and

means for cycling said heat exchange medium through said thermally insulated elongated conduit and said elongated chamber such that said heat exchange medium is in heat exchange relation with said elongated reaction vessel so that heat can be transferred between said heat exchange medium and said reactants in said elongated reaction vessel to bring about and to control a chemical reaction between said reactants.

4,803,055

APPARATUS FOR STERILIZING CONTAINERS

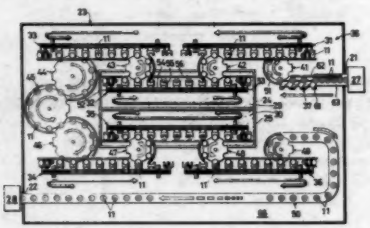
Michio Ueda, Tokushima, Japan, assignor to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed Aug. 31, 1987, Ser. No. 90,989

Claims priority, application Japan, Sep. 24, 1986, 61-226426

Int. Cl.[4] A61L *2/00*; **B08B** *3/08, 9/08*

U.S. Cl. 422—297 **4 Claims**



1. An apparatus for sterilizing containers having an open top and closed bottom comprising:

a closed sterilized chamber having a container inlet and a container outlet;

an antiseptic vessel and a rinse vessel arranged within the sterilized chamber, and

a group of container transport means for transporting a plurality of containers, one container after another from said container inlet, through said sterilized chamber, to said container outlet by way of said antiseptic vessel and said rinse vessel, one of said group of container transport means in each of said antiseptic vessel and saif rinse vessel, each including means for rotating each container, one after another, as each container enters each of said vessels, 180 degrees so that the open top of each container is in the up position, for transporting each container with its open top in the up position through each of said vessels and for again rotating each container 180 degrees as each container is being withdrawn form each of said vessels so that the open top of each container is in the down position.

4,803,056

SYSTEM FOR INCREASING THE CAPACITY OF A TITANIUM DIOXIDE PRODUCING PROCESS

Alan J. Morris, and Merlin D. Coe, both of Oklahoma City, Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 515,888, Jul. 22, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 761,329

Int. Cl.[4] C01G *23/047*; **B01J** *12/02*

U.S. Cl. 422—156 **13 Claims**

1. A reactor for use in producing titanium dioxide by reacting titanium tetrachloride vapors with oxygen comprising:

means for forming a first reaction zone;

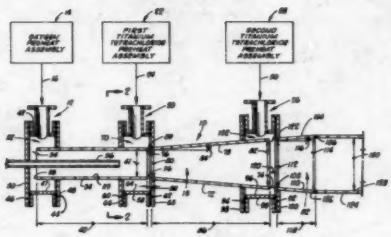
an oxidizing gas introduction assembly for receiving oxygen at a predetermined temperature level and passing the oxygen into the first reaction zone, the oxidizing gas introduction assembly comprising:

a conduit having an upstream and a downstream end and an opening extending therethrough intersecting the upstream and the downstream ends and the oxygen being passable through the opening in the conduit for passing the oxygen into the first reaction zone;

a first titanium tetrachloride introduction assembly for receiving titanium tetrachloride vapors at a first predetermined temperature level and passing the titanium tetrachloride vapors at the first temperature level into the first reaction zone for reacting with the oxygen to produce a mixture including titanium dioxide, the first titanium tetrachloride introduction assembly comprising:

a cylindrically shaped outer case having an upstream end, a downstream end and an opening extending axially therethrough intersecting the upstream and downstream ends;

a cylindrically shaped inner case having an upstream end, a downstream end and an opening extending axially therethrough intersecting the upstream and the downstream ends, the inner case being disposed in the opening in the outer case and the diameter of the outer case provided by the surface formed by the opening extending through the outer case being greater than the diameter formed by the outer peripheral surface of the inner case thereby providing a space between the outer case and the inner case forming a first titanium tetrachloride chamber, one of the upstream and the downstream ends



of the inner case being spaced a distance axially from the respective one of the upstream and the downstream ends of the outer case for forming a slot to pass titanium tetrachloride vapors from the first titanium tetrachloride chamber;

a downstream end wall secured to the downstream end of one of the inner and the outer cases;

an upstream end wall secured to the upstream end of one of the inner and the outer cases, the downstream end of the conduit being removably secured to the upstream end wall for passing the oxidizing gas from the oxidizing gas introduction assembly to the first titanium tetrachloride introduction through the upstream end wall, the upstream and the downstream end walls cooperating to secure the inner and the outer cases in the spaced apart relationship for forming the slot to pass titanium tetrachloride vapors from the first titanium tetrachloride chamber; and

means for passing the titanium tetrachloride vapor at the first temperature level into the first titanium tetrachloride chamber; and

wherein the means for forming the first reaction zone is defined further to include:

a section having an upstream end, a downstream end and an opening extending axially therethrough intersecting the upstream and downstream ends, the upstream end of the section being removably secured to the downstream end wall of the first titanium tetrachloride introduction assembly, the opening extending through the section cooperat-

ing to form the first reaction zone, the upstream and downstream end walls of the first titanium tetrachloride introduction assembly respectively being removably secured to the conduit of the oxidizing gas introduction assembly and the section of the first reaction zone to facilitate the removal or insertion of the first titanium tetrachloride introduction assembly from the conduit of the oxidizing gas introduction assembly and the section of the first reaction zone without disassembly of said conduit, said section and the first titanium tetrachloride introduction assembly.

4,803,057

CONTINUOUS CHROMATOGRAPHIC SEPARATION OF URANIUM ISOTOPES

Kunihiko Takeda, Yokohama, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

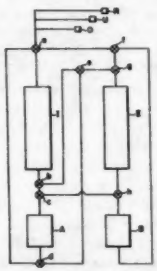
Continuation of Ser. No. 669,390, Nov. 8, 1984, abandoned. This application Sep. 24, 1986, Ser. No. 910,864

Claims priority, application Japan, Nov. 30, 1983, 58-224271

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[4] C22B *60/02*; B01D *59/30*; C01G *43/00*

U.S. Cl. 423—6 **10 Claims**



1. In a process for continuously separating uranium isotpes by passing an acidic solution of a mixture of uranium isotopes in a solvent through an anion exchanger thereby forming on the anion exchanger a boundary (A) between a uranium adsorption zone and an adjacent reducing agent zone and a boundary (B) between a uranium adsorption zone and an adjacent oxidizing agent zone, advancing the uranium adsorption zone through the anion exchanger, effecting reduction at the boudary (A) and effecting oxidation at the boundary (B), thereby effecting enrichment adjacent said boundary, and separating a fraction enriched in one of said isotopes, the improvement which comprises passing an eluent containing a deactivated oxidizing agent and a deactivated reducing agent as a mixture through the anion exchanger to be used for isotope separation to convert said deactivated oxidzing agent and said deactivated reducing agent to activated oxidizing agent and activated reducing agent, respectively, and to form an oxidzing agent zone in the column, and reusing said activated reducing agent for the reduction of uranium.

4,803,058

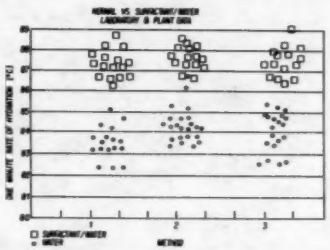
MOISTURIZED COMPOSITIONS OF HYDRATE-FORMING PHOSPHATES AND METHODS FOR PREPARATION THEREOF

Louis A. Highfill, Union, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 30,091, Mar. 31, 1987, Pat. No. 4,770,865, which is a continuation-in-part of Ser. No. 901,920, Aug. 29, 1986, abandoned. This application May 12, 1988, Ser. No. 193,024

Int. Cl.[4] B01F *1/00*; C09K *3/00*; C11D *7/16, 17/06*

U.S. Cl. 252—135 **14 Claims**



1. A composition of matter in particulate, crystalline form, free-flowing during storage and prolonged exposure to ordinary ambient temperature and humidity conditions, having an increased rate of hydration and resistance to caking comprising sodium tripolyphosphate, and from about 0.1% by weight and about 23% by weight added water in the form of water of hydration, said water containing in solution sufficient surfactant to provide the composition with from about 0.2 ppm to about 125 ppm surfactant.

4,803,059

PROCESS FOR THE REDUCTION OF NITROGEN OXIDES IN AN EFFLUENT USING A HYDROXY AMINO HYDROCARBON

James C. Sullivan, Southport, and William R. Epperly, New Canaan, both of Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Filed Apr. 15, 1987, Ser. No. 39,013

Int. Cl.[4] C01B *21/00*

U.S. Cl. 423—235 **23 Claims**

1. A process for the reduction of the concentration of nitrogen oxides in an effluent from the combustion of a carbonaceous fuel, the process comprising injecting a treatment agent comprising a hydroxy amino hydrocarbon into an effluent at an effluent temperature of greater than about 1300° F. under conditions effective to reduce the concentration of nitrogen oxides in the effluent.

4,803,060

PROCESS FOR PRODUCING A CRYSTALLINE GALLIOSILICATE WITH THE FAUJASITE STRUCTURE

Mario L. Occelli, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 1, 1986, Ser. No. 936,731

Int. Cl.[4] C01B *33/20*; B01J *29/04*

U.S. Cl. 423—326 **23 Claims**

1. A process for preparing a crystalline, galliosilicate molecular sieve having the faujasite structure which comprises:

(a) mixing a source of gallia, a source of silica, a source of sodium and water to form a hydrogel having the following oxide mole ratios of components

SiO_2/Ga_2O_3=6 to 15

Na_2O/Ga_2O_3=1 to 5

H_2O/Ga_2O_3=80 to 500

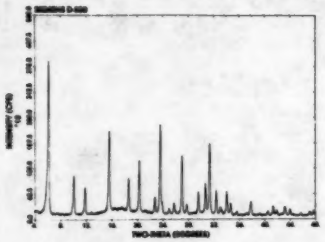
(b) adding to said hydrogel a galliosilicate solution substantially free of alumina and dispersed particles, said solution having the following oxide mole ratios of components

SiO_2/Ga_2O_3=5 to 30

Na_2O/Ga_2O_3=6 to 20

H_2O/Ga_2O_3=200 to 800

to form a mixture of said solution and said hydrogel, said mixture having oxide mole ratios of components falling



within the same ranges as the oxide mole ratios of components in said hydrogel and wherein said solution is prepared by mixing a source of gallia, a source of silica, a source of sodium and water; and

(c) crystallizing said mixture in the absence of stirring at a temperature below about 150° C. to form a galliosilicate molecular sieve having the faujasite structure and containing less than about 0.2 weight percent alumina.

4,803,061

PARTIAL OXIDATION PROCESS WITH MAGNETIC SEPARATION OF THE GROUND SLAG

Mitri S. Najjar, Hopewell Junction, N.Y., and Michael W. Becker, Westminster, Calif., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,122

The portion of the term of this patent subsequent to May 22, 2004, has been disclaimed.

Int. Cl.[4] C01B *31/18*

U.S. Cl. 423—415 A **27 Claims**

1. A process for the production of gaseous mixtures comprising H_2+CO by the partial oxidation of a feedstock comprising a heavy liquid hydrocarbonaceous fuel having a nickel- and vanadium-containing ash or petroleum coke having a nickel- and vanadium-containing ash, or mixtures thereof; and said feedstock includes a minimum of 0.5 wt. % of sulfur and said ash includes a minimum of 5.0 wt. % vanadium, a minimum of 2.0 wt. % of nickel, and silicon; comprising the steps of:

(1) mixing together with said feedstock, additive A comprising an iron-containing additive when the silicon content of said feedstock is less than about 350 ppm, or additive B comprising an iron- and calcium-containing additive when the silicon content of said feedstock is about 400 ppm or more, wherein the weight ratio of additive A or B to said ash is in the range of about 1.0–10.0 to 1.0, and for each part by weight of vanadium there is at least 10 parts by weight of iron when additive A is used, or at least 10 parts by weight of iron plus calcium when additive B is used;

(2) reacting the mixture from (1) at a temperature in the range of about 2200° F. to 3000° F. and a pressure in the range of about 5 to 250 atmospheres in a free-flow refractory-lined partial oxidation reaction zone with a free-oxygen containing gas in the presence of a temperature moderator and in a reducing atmosphere to produce a hot raw effluent gas stream comprising H_2+CO and entrained molten slag including vanadium-containing oxide laths and spinels; and where in said partial oxidation reaction zone when additive A is used said iron-containing additive combines with at least a portion of said nickel constituents and sulfur found in the feedstock to produce a liquid phase washing agent that collects and transports at least a portion of the vanadium-containing oxide laths and spinels and other ash components and refractory out of reaction zone; and when additive B is used separate portions of said iron- and calcium-containing additive (I) combine with a portion of said nickel, calcium and sulfur to generate a liquid phase washing agent that collects and transports a portion of the vanadium-containing oxide laths and spinels and other ash components and refractory; and (II) combine with a portion of said nickel, calcium and silicon to generate a liquid oxide-silicate phase that fluxes substantially all of the remaining portion of said vanadium-containing oxide laths and spinels and other ash components;

(3) cooling and cleaning said hot raw effluent gas stream from (2) by direct contact with water in a quench zone to produce an aqueous suspension of slag and other small solid particles;

(4) grinding and drying the slag and other particulate solids from (3) to produce a ground heterogeneous mixture of particles having varying magnetic susceptibilities, and non-magnetic solid particles; wherein said ground heterogeneous mixture of particles has a particle size of less than 180 microns, and a moisture content of less than 3.0 wt. %;

(5) separating said ground heterogeneous mixture of particles from (4) by electromagnetic means including spaced apart poles by introducing a portion of said ground heterogeneous mixture of solid particles from (4) about 38 to 600 microns thick between the poles of said electromagnetic means having a low magnetic field strength in the range of about 10 to 1000 gausses, and separating a first portion of magnetic particles from a first residue mixture of magnetic and non-magnetic particles; wherein said first portion of magnetic particles comprises a heterogeneous mixture of particles of an Fe-Ni alloy and about 0 to 10 wt. % of magnetite particles; and said Fe-Ni alloy comprises about 70–95 wt. % Fe and the remainder Ni, and said Ni comprises about 40 to 85 wt. % of the total amount of nickel present in the ground mixture of solid particles from (4); and said first portion of magnetic particles comprises about 0.2 to 5.0 wt. % of the ground mixture of solid particles from (4);

(6) separating said heterogeneous mixture of particles from (5) by electromagnetic means including spaced part poles by introducing a portion of said first residue mixture of magnetic and non-magnetic particles from (5) about 38 to 600 microns thick between the poles of said electromagnetic means having a medium magnetic field strength in the range of about 1,000 to 10,000 gausses, and separating a second portion of magnetic particles from a second residue mixture of magnetic and non-magnetic particles; wherein said second portion of magnetic particles comprises a heterogeneous mixture of particles which have a lesser magnetic susceptibility than that of the particles in said first portion of magnetic particles, and which comprises particles of a solid portion of Fe and Ni oxy-sulfide; about 0.1 to 2.0 wt. % of particles of vanadium compounds; and particles of iron silicate and calcium silicate; and said second portion of magnetic particles comprises about 85 to 98 wt. % of the ground mixture of solid particles from (4) and contains about 70 to 95 wt. % of the iron; and

(7) separating said heterogeneous mixture of particles from (6) by electromagnetic means including spaced apart poles by introducing a portion of said second residue mixture of magnetic and non-magnetic particles from (6) about 38 to 600 microns thick between the poles of said electromagnetic means having a high magnetic field strength in the range of about 8,000 to 40,000 gausses, and separating a third portion of magnetic particles from a third residue mixture of particles; wherein said third portion of magnetic particles comprises a heterogeneous mixture of particles which have a lesser magnetic susceptibility than that of the particles in said second portion of magnetic parti-

cles, and which comprises particles of a vanadium-containing spinel; and a mixture of particles comprising at least one metal silicate wherein the metal in said metal silicate is selected from the group consisting of iron, magnesium, aluminum, calcium, and mixtures thereof; and said third portion of magnetic particles comprises about 1 to 14 wt. % of the ground mixture of solid particles from (4) and contains about 60 to 98 wt. % of the vanadium in said mixture from (4).

4,803,062

METHOD FOR PRODUCING TUNGSTEN HEXACHLORIDE

Robin W. Munn, Sayre; Robert P. McClintic, Monroeton, and Kenneth T. Reilly, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 14, 1988, Ser. No. 181,885

Int. Cl.[4] C01G *37/00*

U.S. Cl. 423—492 **1 Claim**

1. In a method for producing tungsten hexachloride comprising reacting tungsten with chlorine gas at a temperature sufficient to result in the conversion of said tungsten to tungsten hexachloride, the improvement comprising reacting tungsten in the form of pressed pieces to convert said pieces to tungsten hexachloride having an oxygen content of less than about 0.5% by weight with the rate of conversion to said tungsten hexachloride being at least about 2.3 times greater than the rate of conversion when said tungsten is in an unpressed form.

4,803,063

PROCESS FOR THE CYCLIC PRODUCTION OF HYDROGEN PEROXIDE

Christian Pralus, Saint-Cyr-Au-Mont-D'Or, France, assignor to Atochem, Puteaux and Oxysynthese, Paris, both of, France

Filed Apr. 1, 1988, Ser. No. 176,194

Claims priority, application France, Apr. 16, 1987, 87 05429

Int. Cl.[4] C01B *15/02*

U.S. Cl. 423—588 **8 Claims**

1. A cyclic process for production of hydrogen peroxide comprising:

alternately reducing and oxidizing a quinone in a solvent medium; and

extracting the hydrogen peroxide formed;

wherein the solvent medium contains a carboxylic acid amide selected from the group consisting of carboxylic acid amides having at least one aryl group wherein an aryl group is attached to the nitrogen or the carbon of the carbonyl group; or an aryl group is attached to the nitrogen and another aryl group, which is the same or different, is attached to the nitrogen or to the carbon of the carbonyl group.

4,803,064

PROCESS FOR PREPARING TITANIUM DIOXIDE IN THE FORM OF SPHERICAL PARTICLES BY HYDROLYSIS OF TI(IV)

Franco Montino, Novara, and Giuseppe Spoto, Turin, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sep. 11, 1987, Ser. No. 95,611

Claims priority, application Italy, Sep. 16, 1986, 21710 A/86

Int. Cl.[4] C01G *23/053*

U.S. Cl. 423—612 **14 Claims**

1. A process for preparing titanium dioxide in the form of spherical particles having diameters ranging from 0.2 to 1.5 μm and a polydispersion index $dw/dn \leq 2$, wherein dw is the average weighed diameter and dn is the average linear diameter of the particles, by hydrolysis of aqueous solutions, strongly acid due to HCl or H_2SO_4, of Ti(IV) and $SO_4^=$ ions, in which the $SO_4^=/Ti(IV)$ ratio is at least higher than 1.5, in the presence of cationic polyelectrolytes, having an average molecular weight

higher than 1 million and a ionicity of at least 3 milliequivalents per gram (meq/g).

4,803,065

PRODUCTION PROCESS OF CHLORINE

Hiroyuki Itoh; Yoshitsugu Kono; Masanobu Ajioka; Shinji Takenaka, and Masafumi Kataita, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jun. 22, 1987, Ser. No. 64,699

Claims priority, application Japan, Jun. 30, 1986, 61-151749; Jun. 30, 1986, 61-151750

Int. Cl.[4] C01B *7/04*

U.S. Cl. 423—502 **11 Claims**

1. A process for producing chlorine by reacting hydrogen chloride and oxygen in the presence of a catalyst, which contains a chromium oxide as a principal component thereof, in a fluidized-bed reactor, which comprises:

(i) providing, as said reactor, a fluidized-bed reactor whose gas-contacting portions are each made of a material consisting essentially of nickel and having an iron content of 1 wt. % or less, said latter reactor having an equivalent diameter of at least 0.05 m;

(ii) filling, as the catalyst, a chromium oxide catalyst, which has a mean particle size of 40–100 μm and a maximum particle size of 200 μm or smaller and contains at least 10 wt. % of particles having particle sizes of 40 μm and smaller, in the thus-provided fluidized-bed reactor, said chromium oxide catalyst being filled in an amount of at least 0.1 m in terms of catalyst layer height in the thus-provided reactor when the chromium oxide catalyst is at rest;

(iii) feeding a first feed gas as an oxygen source and a second feed gas as a hydrogen chloride source into the thus-provided reactor in such amounts that the molar ratio of oxygen in the first feed gas to hydrogen chloride in the second feed gas is at least 0.25 and the hydrogen chloride in the second feed gas is fed at a rate of 100–1800 Nl per hour and per kg of the chromium oxide catalyst filled in the thus-provided reactor;

(iv) allowing the first and second feed gases to flow upwardly at a superficial velocity 0.1–1 m/sec through the thus-provided reactor; and

(v) controlling the internal temperature and pressure of the thus-provided reactor at 350°–450° C. and at least normal pressure respectively.

4,803,066

ANTIBACTERIAL AND/OR ANTIFUNGAL COMPOSITIONS FOR TOPICAL APPLICATION

Linda M. Edwards, Saffron Walden, United Kingdom, assignor to Smith & Nephew Associated Companies p.l.c., England

Filed Mar. 19, 1987, Ser. No. 27,861

Claims priority, application United Kingdom, Mar. 22, 1986, 8607159

Int. Cl.[4] A61K *33/04*

U.S. Cl. 424—132 **26 Claims**

1. A pharmaceutical composition in topical administration

form which comprises a synergistic mixture of an antimicrobial silver compound and an antimicrobial azole compound or a pharmaceutically acceptable acid addition salt thereof in the weight ratio of 10:1 to 1:10; in combination with a topically acceptable carrier therefor.

4,803,067

COMPOSITIONS FOR COSMETICS AND DERMATOLOGY COMPRISING PERFLUOROPOLYETHERS

Fabio Brunetta, Cornuda; Stefano Bader, Melzo, and Giovanni Pantini, Milan, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Mar. 26, 1986, Ser. No. 844,318
Claims priority, application Italy, Mar. 29, 1985, 20161 A/85
Int. Cl.[4] A61K *7/48, 31/77;* C08L *71/02*
U.S. Cl. 424—63 15 Claims

1. A composition comprising a perfluoropolyether liquid dispersed in an oil in water emulsion or in a water in oil emulsion, or in a solid phase suited to form a gel, said solid phase being suspended in a liquid organic phase, said composition containing from 0.05 to 30 parts of perfluoropolyether per 100 parts of the total sum of the other components.

4,803,068

HAIR-TREATMENT PREPARATION FOR IMPROVED WET COMBABILITY

Uwe Ploog, Haan; Peter Busch, Erkrath-Unterbach; Klaus Thiele, Langenfeld; Horst Höffkes, Dusseldorf Heilerhof, and Karl Giede, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 525,971, Aug. 24, 1983, abandoned.
This application Oct. 28, 1987, Ser. No. 115,553
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1983, 3302210
Int. Cl.[4] A61K *7/075, 7/08*
U.S. Cl. 424—70 22 Claims

1. A process for improving the wet combability of hair which comprises applying to said hair an aqueous hair-treatment composition comprising at least one hair-treatment agent and an additive to improve the wet combability of hair wherein said aqueous hair-treatment composition contains an amount sufficient to improve the wet combability of hair of at least one surface-active phosphonic compound selected from the group consisting of:

(1) phosphonic acid compounds having the formula

$$R^1—CH_2—PO_3H_2$$

wherein R^1 is a linear C_7–C_{13} alkyl, and

(2) a water-soluble salt of said phosphonic acid compounds as said additive to improve the wet combability of hair.

13. An aqueous hair-treatment composition comprising at least one hair-treatment agent and an additive to improve the wet combability of hair wherein said aqueous hair-treatment composition contains an amount sufficient to improve the wet combability of hair of at least one surface-active phosphonic compound selected from the group consisting of:

(1) phosphonic acid compounds having the formula:

$$R^1—CH_2—PO_3H_2$$

wherein R^1 is a linear C_7–C_{13} alkyl, and

(2) a water-soluble salt of said phosphonic acid compounds as said additive to improve the wet combability of hair, such composition further characterized as being free of detergent builder salts.

4,803,069

COMPOSITION FOR THE TREATMENT OF ACNE

Sándor Kékesi; Piroska Tamási; Veronika Pál; Sándor Jancsó; Ilona Kristóf née Szvitil; György Bacsa, and Katalin Kovács née Hadady, all of Debrecen, Hungary, assignors to Biogál Gyógyszergyár, Debrecen, Hungary

Filed Feb. 7, 1989, Ser. No. 874,247
Claims priority, application Hungary, Jun. 18, 1985, 2389/85
Int. Cl.[4] A61K *7/45, 7/075, 35/78*
U.S. Cl. 424—74 6 Claims

1. Composition for the treatment of various forms of acne, comprising in an amount of 2%–95% by weight the rhizoma (*Graminia rhizoma*) of wheat grass (Agropyron repens) in admixture with 5%–98% by weight of cosmetically acceptable additives and/or diluents and with or without an antibacterial agent and/or further a plant extract.

4,803,070

IMMUNOLOGICAL EMULSION ADJUVANTS FOR POLYSACCHARIDE VACCINES

John L. Cantrell, Corvallis, and Jon A. Rudbach, Hamilton, both of Mont., assignors to Ribi ImmunoChem Research Inc., Hamilton, Mont.

Filed Apr. 15, 1986, Ser. No. 852,118
Int. Cl.[4] A61K *39/00*
U.S. Cl. 424—92 16 Claims

1. An immunological adjuvant useful for enhancing the immune response against polysaccharide antigens, comprised of:

(1) an emulsion system selected from the group consisting of:

(A) a lipid emulsion system (LES) containing:

(a) a metabolizable oil,

(b) a low molecular weight polyol, and

(c) lecithin, or

(B) an oil-in-water emulsion system O/W containing:

(a) a light hydrocarbon non-biodegradable oil or a biodegradable oil, and

(b) a detergent,

(2) a refined detoxified endotoxin (RDE), and optionally,

(3) trehalose dimycolate, (TDM).

4,803,071

HAIR CARE COMPOSITIONS

Carmine P. Iovine, Bridgewater, and Frank A. Nowak, Jr., Somerville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation of Ser. No. 120,185, Feb. 11, 1980, abandoned.
This application Jun. 5, 1984, Ser. No. 617,416
Int. Cl.[4] A61K *7/06, 7/08, 7/11, 9/12*
U.S. Cl. 424—70 6 Claims

1. An improved hair conditioning composition selected from the group consisting of rinses, lotions, shampoos, and fixatives, comprising an aqueous or aqueous alcoholic carrier and a polymer of N,N-dialkyldiallyl ammonium bromide or chloride, wherein the improvement comprises improved manageability provided by the presence in the composition of from 0.30 to 2% by weight of a water-soluble cationic graft copolymer prepared by polymerizing about 21–25% by weight of a N,N-dialkyldiallyl ammonium halide monomer with about 75–79% by weight of a substrate selected from the group consisting of hydroxyethyl cellulose and hydroxypropyl cellulose the polymerization being carried out in a two-phase system in the presence of a free radical polymerization catalyst other than ceric ions which comprises the steps of:

(a) suspending the substrate in an organic solvent, which solvent has a boiling point at or above the temperature of the polymerization reaction, is immiscible with water and does not dissolve the substrate, monomer or graft copolymer;

(b) adding thereto an aqueous solution of the monomer thereby forming a suspension of discrete aqueous spheres in the organic solvent phase;

(c) deoxygenating and heating the reaction mixture in the presence of the free radical polymerization catalyst to a temperature of 40°–100° C. to initiate polymerization;
(d) continuing the polymerization for from 0.5–6 hours; and
(e) isolating the resultant graft copolymer from the reaction mixture in the form of solid beads; wherein it is required that either the aqueous solution or the substrate suspension or both contain a cationic, anionic or nonionic surfactant and that the solids content of the aqueous polymerization mixture is greater than 50% by weight.

4,803,072

IMMUNOMODULATION

Barbara J. Dalton, Philadelphia, Pa., and Robert C. Rees, Sheffield, England, assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Sep. 10, 1986, Ser. No. 905,825
Int. Cl.[4] A61K *45/02, 37/02*
U.S. Cl. 424—85.5 C 11 Claims

1. A method of modulating the immune response in a human, or other animal, in need thereof by inducing the production of leukocyte IFN which comprises administering an effective, leukocyte interferon production inducing amount of NS1 to such human or animal.

4,803,073

PROCESS FOR THE PASTEURIZATION OF PLASMA PROTEINS AND PLASMA PROTEIN FRACTIONS

Walter Doleschel; Walter N. Doleschel, both of Vienna, and Helmut Kaltschmid, Bad Vöslau, all of Austria, assignors to Schwab & Co Ges.m.b.H., Vienna, Austria

Filed Mar. 9, 1987, Ser. No. 23,185
Claims priority, application Austria, Mar. 18, 1986, 719/86
Int. Cl.[4] A61K *35/16, 37/02;* C12N *7/06*
U.S. Cl. 424—101 8 Claims

1. A process for the pasteurization of dried plasma proteins and plasma protein fractions by heat treatment of their suspensions in a liquid organic heat-transfer agent without essentially impairing their biological activity, which comprises carrying out the heat treatment in symmetrical or in mixed glycerol esters, which are liquid at the pasteurization temperature, of saturated or singly or multiply unsaturated fatty acids having 4–22 carbon atoms, or mixtures of these esters, as the inert heat-transfer agent, with the maximum water content of the suspension being 1% by weight and the temperature being 50°–120° C.

6. The process as claimed in claim 1, wherein the heat treatment is carried out in the presence of Ca salts in the suspension in an amount of 10 to 50 mmol per liter.

4,803,074

FR-900848 SUBSTANCE AND PREPARATION THEREOF

Masaru Yoshida, Tsukuba, and Koki Horikoshi, Tokyo, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 30, 1988, Ser. No. 175,297
Claims priority, application United Kingdom, Apr. 10, 1987, 8708635
Int. Cl.[4] A61K *35/74;* C12P *1/06, 1/04*
U.S. Cl. 424—122 3 Claims

1. FR-900848 substance, wherein FR-900848 substance has following physico-chemical properties:
Appearance: colorless needles
Nature: acidic
Melting point: 198°–201° C. (dec)
Specific rotation: $[\alpha]_D^{20}$: −36.22° (c=0.5, DMSO)
Molecular formula: $C_{32}H_{43}N_3O_6$
Elemental Analysis: Calcd: for $C_{32}H_{43}N_3O_6$: C, 67.94, H, 7.60, N, 7.43; O, 16.97 (%); Found: C, 68.57; H, 7.51; N, 7.53; (O, 16.39) (%)
Molecular weight: FAB-MS m/z 56
Solubility:
soluble: dimethylsulfoxide;
slightly soluble: methanol, ethyl acetate, chloroform;
insoluble: water
Color reaction:
positive: Dragendorff reaction, Ehrlich reaction, cerium sulfate reaction, iodine vapor reaction
negative: Ninhydrin reaction, ferric chloride reaction, Molish reaction
Thin layer chromatography:
Rf value (silica plate, Kieselgel 60 F_{254}, made by Merck & Co., Inc.):
0.55 (chloroform:methanol=5:1);
0.70 (chloroform:methanol included 10% acetic acid=5:1)
High pressure thin layer chromatography:
Rf value (RP-18 F_{254}, made by Merck & Co., Inc.):
0.21 (methanol:10% acetic acid=9:1)
High pressure liquid column chromatography (HPLC):
(Column YMC-Pack A-302 (5 μm, 4.5×150 mm) (made by Yamamura Chemical Institute)
HITACHI M655 HPLC Processor (detect UV 280 nm);
solvent system methanol:10% acetic acid=9:1);
retention time: 4.42 minutes
Ultraviolet absorption spectrum:
$\lambda_{max}^{methanol}$=280 nm (ε=31,000);
$\lambda_{max}^{0.1N\ HCl\text{-}methanol}$=280 nm (ε=31,000);
$\lambda_{max}^{0.1N\ NaCl\text{-}methanol}$=280 nm (ε=31,000)
Infrared absorption spectrum: ν_{max}^{Nujol}=3320, 3250, 3055, 3000(sh), 2950(sh), 2920, 2850, 1760, 1708, 1675, 1650, 1615, 1540, 1520(sh), 1480, 1455, 1410, 1395, 1370, 1350, 1330, 1308, 1270, 1245, 1230, 1202, 1180, 1160, 1133, 1120(sh), 1093, 1068, 1030, 1020, 986, 955(sh), 945, 928, 917, 900, 880, 860, 850(sh), 825, 800, 760, 740, 720 cm^{-1}
^1H Nuclear magnetic resonance spectrum: (DMSO-d_6, 400.13 MHz); δ: 0.01–0.15 (4H, m), 0.29–0.37 (3H, m), 0.39–0.45 (1H, m), 0.46–0.76 (8H, m), 0.92–1.06 (3H, m), 0.99 (3H, d, J=6 Hz), 1.25 (1H, m), 2.43–2.60 (2H, m), 3.21 (1H, m), 3.26–3.44 (3H, m), 3.69 (1H, m), 3.75 (1H, m), 3.94 (1H, m), 4.91–5.00 (2H, m), 5.02 (1H, d, J=4.9 Hz), 5.12 (1H, d, J=5.6 Hz), 5.64 (1H, dd, J=14.9 and 9.4 Hz), 5.66 (1H, d, J=6.0 Hz), 5.89 (1H, d, J=15.0 Hz), 6.20 (1H, dd, J=14.9 and 11.1 Hz), 6.94 (1H, dd, J=15.0 and 11.1 Hz), 8.02 (1H, t, J=5.7 Hz), 10.27 (1H, broad s) ppm
^{13}C Nuclear magnetic resonance spectrum: (DMSO-d_6, 100.62 Hz); δ: 7.60(t), 7.65(t), 11.16(t), 12.95(t), 14.08(d), 14.37(t), 17.65(d), 17.81(d), 18.02(d), 18.29(d), 18.31(q), 19.67(d), 21.00(d), 21.24(d), 22.01(d), 23.28(d), 30.82(t), 35.97(t), 41.031(t), 70.06(d), 71.18(d), 81.21(d), 87.64(d), 121.45(d), 125.48(d), 130.27(d), 130.622(d), 139.44(d), 145.70(d), 153.10(s), 165.60(s), 170.29(s) ppm.

4,803,075

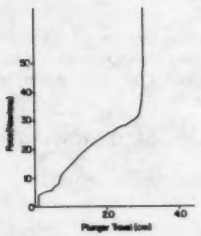
INJECTABLE IMPLANT COMPOSITION HAVING IMPROVED INTRUDABILITY

Donald G. Wallace, Menlo Park; Hertsel Reihanian, San Francisco; Bruce B. Pharriss, Palo Alto, and William G. Braun, Los Altos, all of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Filed Jun. 25, 1986, Ser. No. 878,418
Int. Cl.[4] A61F *2/00*
U.S. Cl. 424—423 34 Claims

1. An injectable implant composition for soft tissue augmentation comprising an aqueous suspension of a particulate biomaterial containing a sufficient amount of a biocompatible fluid lubricant to significantly improve the intrudability of the composition, wherein said particles of biomaterial are fibrils or

beads comprising natural or synthetic polymers, and wherein said fluid lubricant comprises a non-fibrillar high molecular



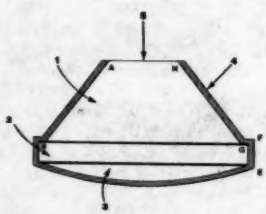
weight charged polymer, a high molecular weight neutral polymer, or a low molecular weight neutral molecule.

4,803,076

CONTROLLED RELEASE DEVICE FOR AN ACTIVE SUBSTANCE

Gautam R. Ranade, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 4, 1986, Ser. No. 904,070
Int. Cl.[4] A23K *1/18*; A01N *29/04*; A61K *31/025, 31/03*
U.S. Cl. 424—438 **39 Claims**



11. A bolus for oral administration into the reticulum or rumen of a ruminant mammal, said bolus being retained in said rumen or reticulum and releasing one or more active agents into the environment of said rumen or reticulum at a substantially constant rate over a prolonged period of time, which comprises said active agent or agents homogeneously disposed in a matrix and contained substantially in the shape of one or a plurality of truncated cones by means of an impermeable wall on the base and side of said truncated cone or cones.

4,803,077

PROCESS TO PREPARE SOLID PRODUCTS CONTAINING OIL-SOLUBLE SUBSTANCE

Masakazu Mitsuhashi; Shuzo Sakai, and Toshio Miyake, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyūjo, Okayama, Japan

Filed Jun. 29, 1987, Ser. No. 70,140
Claims priority, application Japan, Jul. 10, 1986, 61-162657
Int. Cl.[4] A61K *47/00*
U.S. Cl. 424—439 **6 Claims**

1. A process to prepare a solid product containing an edible oil-soluble substance, comprising:

adding an aqueous maltose solution along with a maltose seed to an oil-soluble liquid substance; and

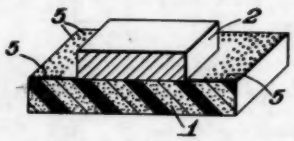
crystallizing beta-maltose hydrate in the mixture to effect solidification.

4,803,078

WOUND DRESSING

Mari Sakai, Okayama, Japan, assignor to Japan Gore-Tex, Inc., Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 172,792
Claims priority, application Japan, Jun. 16, 1987, 62-0913[U]
Int. Cl.[4] A61K *9/70*
U.S. Cl. 424—445 **8 Claims**



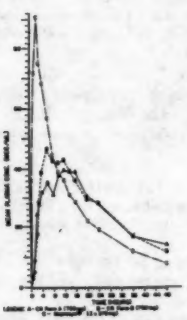
1. A wound dressing comprising a layer of chitin affixed to a layer of porous, expanded polytetrafluoroethylene.

4,803,079

CONTROLLED RELEASE NAPROXEN AND NAPROXEN SODIUM TABLETS

Charles H. Hsiao, Cooper City, Fla., and John S. Kent, Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 504,112, Jun. 14, 1983, Pat. No. 4,571,333. This application Dec. 20, 1985, Ser. No. 811,575
The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.
Int. Cl.[4] A61K *9/22, 9/26*
U.S. Cl. 424—468 **17 Claims**



1. A controlled release tablet for once-daily oral administration of about 500–1200 mg of naproxen or naproxen sodium, which tablet comprises a homogeneous matrix comprising:

about 4–7 weight percent of hydroxypropyl mehylcellulose having a number average molecular weight in the range of from about 80,000 to about 130,000,

about 81–96 weight percent of naproxen or naproxen sodium in an amount effective for once daily oral administration, and

about 0.1 to about 2 weight percent of a pharmaceutically acceptable lubricating agent.

4,803,080

SUSTAINED-RELEASE THEOPHYLLINE FORMULATION

Gerald Benedikt, and Volker Steinijans, both of Constance, Fed. Rep. of Germany, assignors to BYK Gulden Lomberg Chemische Fabrik, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,742

Claims priority, application Switzerland, Dec. 21, 1984, 6111/84; Jun. 24, 1985, 2683/85

Int. Cl.[4] A61K *9/14*

U.S. Cl. 424—488 28 Claims

1. A pharmacologically-acceptable sustained-release theophylline formulation, which comprises matrix pellets in which theophylline particles are embedded in a matrix of water-insoluble plastic and which are enclosed by a membrane of water-insoluble plastic containing embedded particles of lactose.

4,803,081

NEW PHARMACEUTICAL PREPARATIONS WITH EXTENDED RELEASE

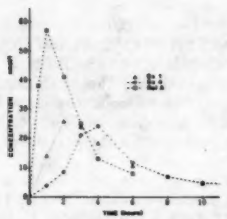
Karl-Erik L. Falk, Lindome; Sven M. Hugosson, Kungsbacka; Adam Rosinski, Mölndal, and John A. Sjogren, Mölnlycke, all of Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

Filed Apr. 3, 1987, Ser. No. 34,500

Claims priority, application Sweden, Apr. 11, 1986, 8601624

Int. Cl.[4] A61K *9/14*

U.S. Cl. 424—488 17 Claims



1. A solid preparation providing extended release of an active compound with very low solubility in water copmrising a solution or dispersion of an effective amount of the active compound in a semi-solid or liquid nonionic solubilizer, wherein the amount by weight of the solubilizer is at least equal to the amount by weight of the active compound, and a release controlling system to provide extended release.

4,803,082

FLAVOR AND SWEETNESS ENHANCEMENT DELIVERY SYSTEMS AND METHOD OF PREPARATION

Subraman R. Cherukuri, Towaco; Steven M. Faust, Stanhope, both of N.J., and Daniel A. Orlandi, Flushing, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 28, 1987, Ser. No. 114,483

Int. Cl.[4] A61K *9/68;* A23G *3/30*

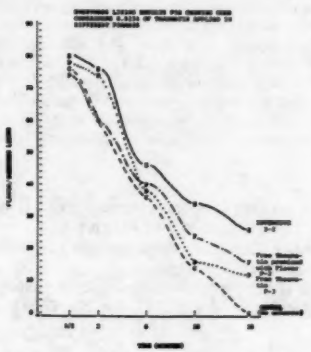
U.S. Cl. 424—493 23 Claims

1. A free flowing particulate delivery system for providing enhanced flavor and sweetness to comestible compositions, said delivery system comprising:

(A) a powdered flavor composition; and

(B) an encapsulating matrix for said powdered flavor composition;

wherein said matrix comprises flavor/sweetness enhancers present in amounts of about 1 to about 30 % by weight of said delivery system selected from the group consisting of thaumetin, monellin, dihydrochalcones and mixtures thereof and a hydrophobic material present in amounts of about 10% to about 70% by weight of said delivery system selected from the group consisting of waxes, fats and mixtures thereof.



4,803,083

METHOD OF OPTIMIZING TEXTURE AND PROCESSABILITY OF CHEWING GUMS AND COMPOSITIONS MADE THEREFROM

Albert H. Chapdelaine, Naperville; Vasek J. Kures, Willow Springs, and Ronald T. Grey, Chicago, all of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Mar. 16, 1987, Ser. No. 25,939

Int. Cl.[4] A23G *3/30*

U.S. Cl. 426—3 35 Claims

1. In a process of developing a new or reformulated chewing gum composition containing gum base, bulking and/or sweetening agents including powdered sorbitol, plasticizers and optional fillers, flavors, colors and processing aids, comprising the steps of (1) making a sample batch of a gum composition, (2) evaluating the texture and processabilitiy of the sample and (3) producing and evaluating subsequent sample batches with different amounts of ingredients until acceptable texture and processability characteristics are obtained, the improvement comprising:

(a) using at least two different sorbitol powders in one or more of the sample batches, wherein the sorbitol powders differ significantly with respect to one or more characteristics chosen from the group consisting of

(i) particle size distribution and

(ii) particle morphology; and

(b) varying the ratio between the at least two sorbitol powders in subsequent sample batches to improve the texture and processability characteristics of the gum formulation.

4,803,084

SHELF-STABLE, SOFT DOUGH PRODUCT

Ward Shine, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Oct. 23, 1985, Ser. No. 790,602

Int. Cl.[4] A21D *2/16, 8/04*

U.S. Cl. 426—20 11 Claims

1. A method of preparing a shelf-stable, soft dough product having an A_w of 0.75 or less which comprises:

(a) preparing a leavened dough from a mixture comprising flour, water, and a leavening agent;

(b) adding to the leavened dough

(i) at least one antifirming agent including an oligomaltosaccharide;

(ii) a monoglyceride ester; and

(iii) at least one starch hydrolyzate selected from maltodextrin and corn syrup solids;

(c) forming the dough into a desired configuration; and

(d) cooking the formed dough;

wherein the oligomaltosaccharide containing antifirming agent is obtained by subjecting maltodextrin or corn syrup solids to the enzymatic activity of diastatic malt and the dough comprises from 15% to 40% flour, from 15% to 30% water, from 2% to 8% monoglyceride ester, and from 20% to 50% maltodextrin or corn syrup solids, inclusive of the maltodextrin or corn syrup solids that are enzymatically modified to produce the oligomaltosaccharide-containing antifirming agent.

4,803,085

PRESERVATIVE COATING FOR HARD SOLID ANIMAL FEED SUPPLEMENT

John E. Findley, Claremont, Calif., assignor to Pacific Kenyon Corp., Long Beach, Calif.

Continuation of Ser. No. 771,603, Sep. 3, 1985, abandoned. This application May 1, 1987, Ser. No. 47,504

Int. Cl.[4] A23K *1/22*

U.S. Cl. 426—69 **8 Claims**

1. In a method for manufacturing a poured solid animal feed supplement wherein a solidifying aqueous solution of sugar, protein, and mixtures thereof is poured into containers and permitted to solidify into solids having top exposed surfaces therein, the improvement comprising; applying, to the exposed surfaces of said supplement in said containers, an aqueous solution consisting essentially of water soluble polyvinyl alcohol in an amount sufficient to form a film having a thickness from 0.1 to about 10 mils.

4,803,086

AUTOMATICALLY MAKING FOOD PRODUCTS SUCH AS BREAD, CAKES AND THE LIKE

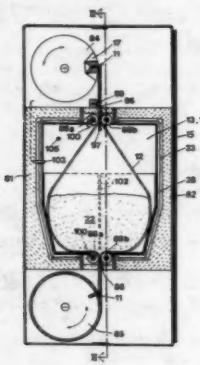
Gunnar Hedenberg, Uddevalla, Sweden, assignor to Heden-Team Aktiengesellschaft, Triesenberg, Liechtenstein

PCT No. PCT/EP86/00786, § 371 Date Jul. 22, 1987, § 102(e) Date Jul. 22, 1987, PCT Pub. No. WO87/03784, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 18, 1986, Ser. No. 93,741

Int. Cl.[4] A47J *27/62, 37/01*

U.S. Cl. 426—87 **14 Claims**



1. Apparatus for automatically making food products in piece form from dough-like substances, comprising a housing containing holding means adapted to be affixed to opposed edges of a flexible bag containing ingredients for the dough-like substance, kneading means for mechanically working the ingredients in the bag and including moving means for creating relative movement between the bag and the kneading means so that the ingredients are kneaded into a dough-like substance, heat treatment means for baking the kneaded dough-like substance, and programmable control means for controlling the sequential operation of the kneading means and heat treatment means, wherein the apparatus further comprises scanning means located adjacent the path of the bag as moved by the moving means for reading machine-readable indicia on a bag and for providing an output coupled to the control means to command operation of the control means.

4,803,087

COMPOSITION AND METHOD FOR PRODUCING VITAMIN-ENRICHED MILK

Timothy J. Karinen, Round Lake Beach, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1987, Ser. No. 76,109

Int. Cl.[4] A23L *1/303, 9/20, 5/00*

U.S. Cl. 426—73 **24 Claims**

1. A method for enriching milk with vitamins, comprising adding to raw milk an aqueous emulsion of (i) edible oil, (ii) a source of at least one vitamin selected from the group consisting of vitamin A, vitamin D and mixtures of vitamins A and D, and (iii) an emulsifying amount of an emulsifying agent that is a combination of (a) a member selected from the group consisting of food grade polyoxyethylene sorbitan oleates, polyoxyethylene sorbitan stearates and mixtures thereof, and (b) a member selected from the group consisting of food grade oleic acid monoesters of glycerol, sorbitol and sucrose, polyglycerol esters of edible fatty acids, polyoxyethylene glycerates and mixtures thereof, the weight ratio of (a):(b) being from about 2:5 to about 5:2.

4,803,088

CONTAINER PACKED WITH INSTANT FOOD FOR USE IN MICROWAVE OVEN

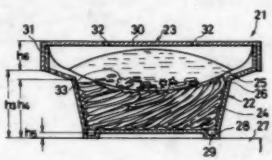
Masanori Yamamoto, Kaizuka; Tamotsu Kamoda, Kishiwada; Makoto Nakahara, Higashiosaka; Yoshimasa Fujii, Yamato-Kouriyama, and Shozo Sugano, Nara, all of Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan

Filed Apr. 25, 1986, Ser. No. 855,673

Claims priority, application Japan, May 1, 1985, 60-94385; Aug. 7, 1985, 60-121415[U]; Sep. 18, 1985, 60-143177[U]

Int. Cl.[4] B65D *81/34*

U.S. Cl. 426—107 **1 Claim**



1. A container packed with instant food which is for use in a microwave oven, said container comprising:

(a) a container body having an opening at its upper portion and a lid which is capable of tightly or substantially tightly sealing said container body by covering the opening, said lid having a plurality of holes therethrough such that the total surface area represented by said plurality of holes relative to the total area of the opening is between 0.005% and 1%, said container body and said lid being made of materials through which microwaves are transmitted;

(b) dehydrated instant food comprising instant noodles containing an edible foaming substance and seasoning ingredients accommodated in said container body;

(c) a second container in the form of a retort pouch accommodated in said container body, said second container hermetically containing a seasoning soup containing an

edible foaming substance and having a viscosity of 1750 poise or less at a temperature of 60° C., said seasoning soup having a water content of an amount equivalent to between 100 to 155 wt. % of the water absorption capacity of said dehydrated instant food; and

(d) a member on the bottom of said container body for raising said container body above a surface on which it is placed, said member containing a large number of depressions,

wherein:

(e) said dehydrated instant food is held in place or substantially held in place in said container body by said second container;

(f) said dehydrated instant food is formed in a shape in which the upper central portion thereof is concave;

(g) the void proportion of said instant noodles is between 32% and 85%;

(h) the mass of said instant noodles has a height of 50 mm or less;

(i) said instant noodles are formed into a mass in which the noodles of the upper portion are loosely arranged and those of the lower portion are densely packed together; and

(j) the lower half of said mass of instant noodles has a void proportion which is between 52% and 97% of that of the upper half.

4,803,089

PROCESS FOR TREATING DAIRY BY-PRODUCTS

Michel Chaveron, La Tour-de-Peilz, and Fred Neumann, Steffisburg, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 700,765, Feb. 12, 1985, abandoned. This application Apr. 28, 1987, Ser. No. 45,757

Claims priority, application European Pat. Off., Mar. 2, 1984, 84102225.4

Int. Cl.[4] A23C *9/144, 9/146*

U.S. Cl. 426—239 **15 Claims**

1. A process for decationizing and obtaining decationized products from whey products comprising passing whey products through a weak cationic resin charged with H^+ ions and then through a strong cationic resin charged with H^{30} ions for obtaining decationized whey products and subsequently passing a concentrated aqueous solution of an acid through the strong cationic resin and then through the weak cationic resin for regenerating and recharging the resins with H^{30} ions for the decationization the whey products with the resins.

4,803,090

PROCESS FOR PRODUCING A MICROWAVE PUFFED CHEESE SNACK

Lance E. Schlipalius, Victoria, Australia; Jeffrey J. Myers, DesPlaines, and Jonathan P. Frey, Arlington Heights, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Nov. 13, 1986, Ser. No. 930,647

Claims priority, application Australia, Nov. 13, 1985, PH3387

Int. Cl.[4] A23C *19/086, 19/09*

U.S. Cl. 426—242 **6 Claims**

1. A process for producing a dry, crisp, puffed, natural butterfat containing cheese snack food product without oiling off comprising the steps of

(a) forming hot viscous drops of cheese base material or processed cheese or slicing or dicing natural cheese, cheese base material or process cheese into pieces to provide cheese precursor pieces having a fat content in the range of 17–34 weight percent, and a moisture content of 20–50%,

(b) depositing the precursor pieces on to a surface,

(c) baking the precursor pieces in a convection oven,

(d) simultaneously or subsequent to said baking, subjecting the precuror pieces to a microwave cokking and drying step to puff the pieces without oiling off, in which the moisture content of the puffed product is less than 5% of that of the starting precursor pieces, and

(e) cooling the cooked, dried, puffed product.

4,803,091

CORN SPIRALS AND METHOD OF MANUFACTURE

George P. Mottur, Danville; Norman E. Peters, Berwick, and Ron L. Nietz, Bloomsberg, all of Pa., assignors to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 824,720, Jan. 31, 1986, abandoned. This application Mar. 17, 1988, Ser. No. 170,114

Int. Cl.[4] A23L *1/10*

U.S. Cl. 426—439 **11 Claims**

1. A process for producing a cooked snack food product comprising subjecting a ground masa made from dehulled corn kernels to comminution by simultaneously grating and cutting that reduces the size of particles in the masa, passing the comminuted masa through a die to a ribbon-like form, severing said ribbon-like material to form snack-sized pieces, and cooking said pieces.

4,803,092

METHOD OF ACIDULATING A COMMINUTED MEAT PRODUCT

Herbert D. Weiss, Suffern, N.Y., and Robert G. Reynolds, Harrington Park, N.J., assignors to Balchem Corporation, Slate Hill, N.Y.

Division of Ser. No. 920,185, Oct. 17, 1986, Pat. No. 4,772,477. This application Apr. 28, 1988, Ser. No. 187,651

Int. Cl.[4] A23L *1/317*

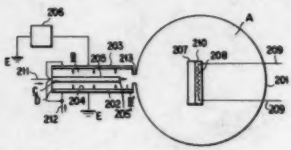
U.S. Cl. 426—646 **11 Claims**

1. A method of lowering the pH of a moist comminuted meat product, the meat product having an initial pH of about 6 and which is to be processed at a processing temperature below about 135° F., to a pH level below about 5.2 in not less than one hour after adding the acidulant to the meat product, comprising:

(a) mixing an acidulant into said meat product, the acidulant having a delayed release coating encapsulating the acidulant, about 50 to 70 wt. % of the coating consisting of a water-soluble glyceride, said water-soluble glyceride having a melting point above said processing temperature and about 30 to 50 wt. % of the coating consisting of a hydrogenated vegetable oil, said hydrogenated vegetable oil having a melting point above said processing temperature; and

(b) allowing water in said meat product to dissolve the water-soluble glyceride, thereby destroying the coating and releasing the acidulant into the food.

4,803,093
PROCESS FOR PREPARING A FUNCTIONAL DEPOSITED FILM
Shunichi Ishihara, Ebina; Keishi Saito, Nabari; Shunri Oda, Tokyo, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 24, 1986, Ser. No. 843,236
Claims priority, application Japan, Mar. 27, 1985, 60-62707
The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—35 3 Claims



1. A process for preparing a functional deposited film on a substrate, said process employing (i) a precursor as a constituent for the film which precursor is substantially nonreactive as long as it remains in its original energy state and (ii) an active species which can react with and impart energy to the precursor to activate the precursor to a state capable of contributing to formation of said film, said process comprising the steps of:

(a) generating said active species by subjecting a gaseous substance capable of being activated to generate said active species to the action of activating energy sufficient to generate said active species in an active species generating and transporting space leading to a film forming space containing the substrate;

(b) simultaneously generating said precursor by subjecting a gaseous substance capable of generating said precursor to the action of activating energy sufficient to generate said precursor in a precursor generating and transporting space located separately from and within the active species generating and transporting space and open in a downstream region of that space; and

(c) introducing the resulting active species and precursor into the film forming space to chemically react to form the functional deposited film on the substrate in the absence of a plasma.

4,803,094
METALLIZED COATING
Richard A. Myers, 1127 Maple Ave., Downers Grove, Ill. 60515
Filed May 9, 1988, Ser. No. 191,920
Int. Cl.[4] B05D 3/06; C23C 14/02, 14/26
U.S. Cl. 427—40 5 Claims

5. A method for the vapor deposition of a thin stainless steel film onto a polymeric surface, comprising:

(a) placing said polymeric surface within a vacuum chamber;

(b) evacuating said vacuum chamber to a near-perfect vacuum;

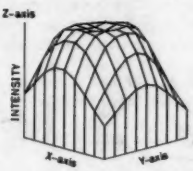
(c) filling said chamber with argon gas;

(d) applying sufficient voltage and amperage to the argon gas in said chamber to electrically excite said argon gas, thereby creating a cloud of free argon electrons which prepares and imparts a charge to said polymeric surface;

(e) evacuating said argon from said chamber, and placing said chamber at a suitable plating vacuum;

(f) energizing an electrode disposed within said chamber and wrapped with a 316L-grade stainless steel yarn comprised of a plurality of thin strands of said stainless steel, each of said strands having a diameter not exceeding 20 microns, said electrode being energized sufficiently to vaporize said stainless steel, whereby said vaporized stainless steel is transported towards and coated onto said prepared, charged polymeric surface.

4,803,095
CHEMICAL VAPOR REACTION PROCESS BY VIRTUE OF UNIFORM IRRADIATION
Shigenori Hayashi; Naoki Hirose; Takashi Inujima, all of Atsugi, and Kenji Ito, Machida, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
Division of Ser. No. 97,188, Sep. 16, 1987, Pat. No. 4,768,464.
This application Feb. 10, 1988, Ser. No. 154,290
Claims priority, application Japan, Sep. 26, 1986, 61-148082; Sep. 26, 1986, 61-229255; Sep. 26, 1986, 61-229256; Sep. 26, 1986, 61-229257; Sep. 26, 1986, 61-229258
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—54.1 2 Claims



1. A chemical vapor reaction process comprising:

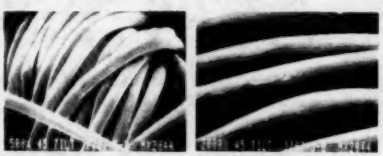
disposing a substrate in a reaction chamber;

inputting a reactive gas to said reaction chamber; and

irradiating said substrate with light from a light source,

said process characterized in that the intensity of the light incident on said substrate at the center position thereof is lower than that at the peripheral position.

4,803,096
ELECTRICALLY CONDUCTIVE TEXTILE MATERIALS AND METHOD FOR MAKING SAME
Hans H. Kuhn, Spartanburg, and William C. Kimbrell, Jr., Inman, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.
Filed Aug. 3, 1987, Ser. No. 81,069
Int. Cl.[4] B05D 5/12; H01B 1/00
U.S. Cl. 427—121 24 Claims



1. A method for imparting electrical conductivity to a textile material, which comprises contacting the textile material with an aqueous solution of an oxidatively polymerizable compound, selected from a pyrrole compound and an aniline compound, and an oxidizing agent capable of oxidizing said compound to a polymer, said contacting being carried out in the presence of a counter ion which imparts electrical conductivity to said polymer when fully formed, said contacting being under conditions at which the compound and the oxidizing agent react with each other to form a prepolymer in said aqueous solution before either the compound or the oxidizing agent are adsorbed by, or deposited on or in, the textile material, but without forming a conductive polymer, per se, in said aqueous solution; adsorbing onto the surface of said textile material the prepolymer and allowing the adsorbed prepolymer to polymerize while adsorbed on said textile material so as to uni-

formly and coherently cover the textile material with a conductive film of said polymer.

4,803,097

METAL PLATING OF PLASTIC MATERIALS

Howard A. Fraenkel, Lebanon, N.J.; Karen A. Davenport, Liverpool, and Frank A. Spicciati, Baldwinsville, both of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 20, 1987, Ser. No. 40,445
Int. Cl.[4] B65D 3/10
U.S. Cl. 427—307 38 Claims

1. A process for metal plating a natural or synthetic plastic material to form a metal plated substrate having improved peel strength which process comprises:

(a) exposing said material to an atmosphere comprising ozone;

(b) contacting said exposed material with a conditioning solvent selected from the group consisting of aqueous conditioning solvents comprising an effective amount of one or more alcohols and one or more strong bases, and solvents comprising one or more strong bases;

(c) contacting said material with an effective amount of one or more oxidizing agents;

(d) depositing a metal coating upon said conditioned surface from an electroless plating bath to form said metal plated substrate; and

(e) annealing the metal coated substrate.

4,803,098

PROCESS FOR THE PREPARATION OF THE SURFACE OF A URANIUM AND TITANIUM ALLOY MEMBER, PARTICULARLY WITH A VIEW TO CHEMICAL NICKEL PLATING

Antoine Henri, Paris; Daniel Lefevre, Longvilliers, and Patrick Massicot, Vanves, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Nov. 5, 1986, Ser. No. 927,336
Claims priority, application France, Nov. 19, 1985, 85 17068
Int. Cl.[4] B05D 3/04, 3/10
U.S. Cl. 427—309 11 Claims

1. A process for preparing the surface of a uranium and titanium alloy which comprises chemically etching said surface with an etching solution containing effective amounts of lithium chloride and hydrochloric acid, subsequently recovering uranium from the etching solution and recycling said solution to the etching process.

4,803,099

MODIFIED POLYETHYLENE, METHODS FOR ITS PREPARATION AND METHODS FOR FINISHING THE EXTERNAL SURFACES OF GLASS CONTAINERS

Erich Ruf, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG

Filed Aug. 4, 1987, Ser. No. 81,482
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629146
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—314 4 Claims

1. A method of finishing the surface of a glass object, which comprises applying to the surface an effective amount of an aqueous dispersion of polyethylene with an average molecular weight of 500 to 10,000 and having at least one laterally bound group of the formula

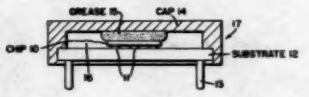
wherein R^1 and R^2 are the same or different and represent a low molecular weight alkyl group with 1 to 4 carbon atoms and n is 2 or 3 and drying the surface.

4,803,100

SUSPENSION AND USE THEREOF

Joseph G. Ameen, Apalachin; Timothy F. Carden, Vestal; Lawrence R. Cutting, Owego; Stephen R. Engle, and Ronald J. Moore, both of Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1987, Ser. No. 110,892
Int. Cl.[4] B05D 3/02; C09K 5/00; H01B 3/20
U.S. Cl. 427—387 12 Claims



1. A method of coating a substantially uniform conformal layer of material onto a workpiece which comprises:

(a) providing a suspension of a coating material wherein said coating material has hydrogen bonds and predetermined physical and chemical characteristics in a predominantly solid state in a polar organic solvent which polar solvent is capable of breaking said hydrogen bonds and providing said material in liquid form;

(b) applying said suspension to a workpiece to coat said workpiece conformally; and

(c) evaporating said polar organic solvent so that said material is provided in its predominantly solid state having at least substantially said predetermined physical and chemical characteristics.

4,803,101

MICROCRACK RESISTANT COMPOSITES

Beverly K. Roberts, Hockessin, Del., and George E. Zahr, Glen Mills, Pa., assignors to E. I Du Pont De Nemours and Company, Wilmington, Del.

Filed Jun. 29, 1987, Ser. No. 67,116
Int. Cl.[4] B32B 3/12
U.S. Cl. 428—116 4 Claims

1. A process for preparing epoxy resin impregnated woven fabrics of poly(paraphenylene terephthalamide) filaments which are resistant to microcracking when employed as facesheets over a honeycomb core of poly(metaphenylene isophthalamide) and subjected to cycling between 160° F. and −65° F. which comprises the steps of:

(a) precoating a woven fabric of poly(phenylene terephthalamide) filaments with from 0.1 to 10% by wt. based on the weight of the fabric of a mixture of an epoxy resin and a urethane rubber soluble in the epoxy resin, said rubber being present in an amount of from 5 to 40% by wt. of the mixture, and said mixture having a strain to failure of at least 2.5% at −65° F.;

(b) heating the precoated fabric to an elevated temperature in the range of 250° to 400° F. for a time sufficient to "B" stage the resin;

(c) impregnating the resulting precoated fabric with from 35 to 70% by wt., based on the weight of the fabric of an epoxy resin having a modulus in excess of 400,000 psi; and

(d) heating the impregnated product to an elevated temperature in the range of 250° to 400° F. for a time sufficient to "B" stage the resin,

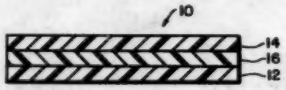
each of steps (a) to (d) above being carried out at a warp tension of less than 0.4 lb/in. of warp width.

4,803,102

MULTIPLE LAYER PACKAGING FILMS AND PACKAGES FORMED THEREFROM

Jean E. Raniere, Huntington Beach; Steven L. Smith, Mission Viejo, both of Calif.; Russell P. Gehrke, Neenah, and Richard E. Johnson, Jr., Appleton, both of Wis., assignors to American National Can Company, Chicago, Ill. and Kendall McGraw Laboratories, Inc., Irvine, Calif.

Continuation of Ser. No. 802,876, Nov. 29, 1985, abandoned.
This application Oct. 27, 1987, Ser. No. 113,415
Int. Cl.[4] B65D *65/02*
U.S. Cl. 428—35.2 20 Claims



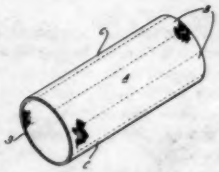
1. A multiple layer film, comprising:
(a) a first layer, the composition of said first layer being selected form the group consisting of polyesters, copolyesters, polycarbonates, and polyether block amide copolymers;
(b) a second sealant layer, the composition of said second layer comprising a composition of polypropylene polymer and a styrene ethylene butylene styrene copolymer; and
(c) a third adhesive layer adhering said first layer to said second layer with good adhesion, said third layer being positioned between said first and second layers, the composition of said third adhesive layer being styrene ethylene butylene styrene copolymer.

4,803,103

RECOVERABLE ARTICLE

Kenneth B. Pithouse, Lesulis, France; Thomas A. Kridl, Union City, and James T. Triplett, Livermore, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 567,127, Dec. 30, 1983, abandoned.
This application Dec. 22, 1986, Ser. No. 945,186
Claims priority, application United Kingdom, Jan. 6, 1983, 8300222; Aug. 16, 1983, 8322004
The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.
Int. Cl.[4] F16L *11/02*; H01R *4/00*
U.S. Cl. 428—34.5 24 Claims



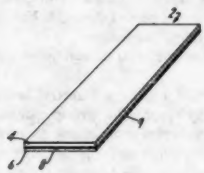
1. A hollow recoverable sleeve suitable for environmental protection of a substrate, which comprises:
a recoverable fabric having a plurality of zones respective zones having different recovery ratios or forces, the fabric having been woven from a plurality of fibres of different recovery ratios or forces, respective fibres corresponding to respective zones;
a polymeric matrix material by means of which the fabric is rendered substantially impervious;
the sleeve having a length greater than its diameter.

4,803,104

ARTICLE FOR JOINING DIMENSIONALLY RECOVERABLE PARTS

Paul G. L. Peigneur, Saint-Truiden; Yvo F. H. Leest, Binkom, and Jozef F. L. Van Beersel, Temse, all of Belgium, assignors to N.V. Raychem SA, Belgium

Continuation of Ser. No. 738,928, May 29, 1985, abandoned.
This application Jun. 19, 1987, Ser. No. 61,605
Claims priority, application United Kingdom, May 29, 1984, 8413687; Apr. 4, 1985, 8508955
Int. Cl.[4] B32B *3/00*, *31/00*
U.S. Cl. 428—35.1 18 Claims



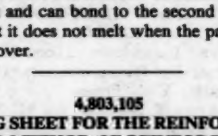
1. A heat stable closure patch for joining overlapping edges of a dimensionally recoverable polymeric cover, comprising first and second polymeric layers of substantially the same composition bonded to each other through an apertured reinforcing layer sandwiched therebetween, wherein the second layer is either non cross-linked or has a hot modulus sufficiently low that it can fuse when the patch is heated to form a bond to the recoverable cover, and wherein the first layer is cross-linked, and has a hot modulus sufficiently low that it is compatible with and can bond to the second layer, and sufficiently high that it does not melt when the patch is heated to bond it to the cover.

4,803,105

REINFORCING SHEET FOR THE REINFORCEMENT OF PANEL AND METHOD OF REINFORCING PANEL

Robert P. Kretow, Howell, and John W. Powers, Old Bridge, both of N.J., assignors to Essex Specialty Products, Inc., Clifton, N.J.

Filed Feb. 13, 1987, Ser. No. 14,636
Int. Cl.[4] A61F *13/02*
U.S. Cl. 428—40 19 Claims



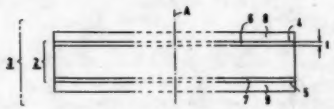
1. A reinforcing sheet adaptable to the reinforcement of a panel formed of metal, plastic or sheet molding compound, which reinforcing sheet comprises:
a thermosetting adhesive layer having a first and a second surface, the first surface being in contact with the panel when applied to the panel to be reinforced;
a moisture impermeable barrier embedded in the thermosetting adhesive layer to prevent moisture from adversely affecting the cohesion of the thermosetting adhesive layer between the panel and the moisture impermeable barrier upon curing the thermosetting adhesive layer when applied to the panel to be reinforced, said moisture impermeable barrier being adhered to the thermosetting adhesive and being stable up to the curing temperature of the thermosetting adhesive; and
a reinforcement adhered to the second surface of the thermosetting adhesive layer opposite the first surface to be applied to the panel to be reinforced.

4,803,106

DISC-SHAPED CARRIER BODY FOR A RECORDING MEDIUM AND METHOD FOR MANUFACTURING SAME

Armin Lenhart, Erlangen, and Karl-Rupprecht Hub, Donauwörth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 72,119
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3624061; Aug. 7, 1986, 3626658
Int. Cl.[4] G11B 5/704
U.S. Cl. 428—64 21 Claims



1. A recording medium comprising a disc-shaped carrier body of nonmagnetic material, said carrier body having at least one flat side having a smooth surface, to which flat side at least one storage layer which can be magnetized particularly perpendicularly (vertically) is applied, wherein a chemically hardened glass substrate is provided as the carrier body comprising Na^+ ions and K^+ ions incorporated in zones adjacent to its surfaces, and further comprising Ag^+ ions and Ag atoms, the depth of the surface zones measured perpendicularly relative to the flat sides being greater than 100 μm, the surface roughness of the at least one flat side of the glass substrate provided with the storage layer being less than 2 μm and the maximum roughness depth of the flat side provided with the storage layer of the glass substrate, referred to a measurement distance 2 mm long, being less than 40 nm, said substrate having a content of Al_2O_3 which is less than 5%.

6. A method for manufacturing a recording medium comprising a disc-shaped carrier body of a nonmagnetic material, said carrier body having at least one flat side having a smooth surface, to which flat side at least one storage layer which can be magnetized particularly perpendicularly (vertically) is applied, wherein a glass substrate is provided as the carrier body comprising Na^+ ions and K^+ions incorporated in zones adjacent to its surfaces, and further comprising Ag^+ ions and Ag atoms, the method comprising the steps of chemically hardening the glass substrate by means of an ion exchange process below the transformation temperature characteristic of the glass material, placing the glass substrate in a KNO_3 melt for a predetermined period of time, and cooling the substrate outside the melt to room temperature, the depth of the surface zones measured perpendicularly relative to the flat sides being greater than 100 μm, the surface roughness of the at least one flat side of the glass substrate provided with the storage layer being less than 2 μm, and the maximum roughness depth of the flat side provided with the storage layer of the glass substrate, referred to a measurement distance 2 mm long, being less than 40 nm, said substrate having a content of Al_2O_3 which is less than 5% and applying to said at least one flat side said storage layer.

4,803,107

LIGHT WEIGHT THERMAL INSULATION MATERIAL PRODUCT AND PROCESS

Jack V. Knowles, 420 S. Francis, Lansing, Mich. 48912

Filed May 2, 1988, Ser. No. 189,400
Int. Cl.[4] C04B 7/02; B32B 13/00, 5/16
U.S. Cl. 428—68 20 Claims

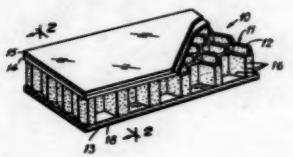
1. A thermal insulation material comprising: a product produced from a dry mix of pumice in small particleized form by volumn in the approximate range of 7% to 20% of the dry mix; scoria in particleized form in the approximate range of 30% to 50% of the dry mix; vermiculite in flaked particle form in the approximate range of 7% to 20% of the dry mix; and cement in the approximate range of 15% to 40% of the dry mix; and water is then added to the dry mix in the approximate range of 0.50 to 1.050 the volume of the dry cement to produce the product, a light weight thermal insulation construction material product.

4,803,108

HONEYCOMB REINFORCING SHEET FOR THE REINFORCEMENT OF PANELS AND METHOD OF REINFORCING PANELS

William E. Leuchten, Mountain Lake, and Robert P. Kretow, Howell, both of N.J., assignors to Essex Specialty Products, Inc., Clifton, N.J.

Filed May 1, 1987, Ser. No. 44,885
Int. Cl.[4] B32B 3/12
U.S. Cl. 428—118 17 Claims



1. A reinforcing sheet adaptable to the reinforcement of a panel formed of metal, plastic or sheet molding compound, which reinforcing sheet comprises:

a first reinforcing member which includes a honeycomb member having columns that define cell apertures with open ends and a first thermosetting adhesive layer present on one end of said columns for applying the honeycomb member to the panel; and

a second reinforcing member which includes a second thermosetting adhesive layer present on the other end of said columns and a reinforcement backing adhered to the second thermosetting adhesive layer,

said open ends of the honeycomb member being covered by the adhesive layers and

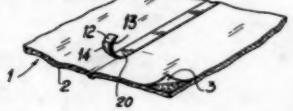
said honeycomb member having perforations for allowing gas to escape from the cell apertures during curing of the first and second thermosettng adhesive layers.

4,803,109

METHOD FOR PROTECTION AND WATERPROOFING OF STITCH LINES IN PADDING AND PADDED GARMENTS

Lucio Saniscalchi, Via Milano, 53, 22059 Robbiate (Como), Italy

Filed Jun. 23, 1987, Ser. No. 65,728
Claims priority, application Italy, Jun. 27, 1986, 20953 A/86
Int. Cl.[4] B32B 3/06, 3/08
U.S. Cl. 428—104 2 Claims



1. A method for the protection and waterproofing of lines of stitching between connected pieces of padding having a high degree of thermal insulation, comprising the steps of

providing a self-adhesive tape having an adhesive side and an opposite non adhesive side;

cold applying, by contact, over said lines of stitching said

adhesive side of said self-adhesive tape, said self adhesive-tape having

a support layer, a cladding of waterproofing synthetic resin coated on said non adhesive side of said self-adhesive tape and an elastomer based self-adhesive layer coated on said adhesive side, wherein said support layer is made from a polyamide fibre fabric of between 50 and 60 grammes/meter, said cladding of waterproofing synthetic resin is made of a polyurethane resin applied at a rate of 5–15 grammes/square meter and said elastomer based self-adhesive has the following formulation in parts by weight:

natural rubber	20.000
antioxidant (sterically inhibited polyphenol)	0.100
active zinc oxide	2.000
zinc resinate	1.500
stearic acid	0.100
hydrogenated polycyclodiene hydrocarbon resin	9.000
aliphatic hydrocarbon resin with cyclic structure	2.000
polyaliphatic hydrocarbon resin	5.000
reactive alkylphenolic resin	3.500
terpene phenolic resin	2.000
polyvynil isobutyl ether (60% in benzene)	2.000
hexane	50.000
toluene	50.000
methyl alcohol	2.000.

2. An item of clothing having a layer of padding comprising a plurality of padding pieces stitched together, wherein the stitching lines joining said padding pieces are rendered waterproof by the method according to claim 1.

4,803,110

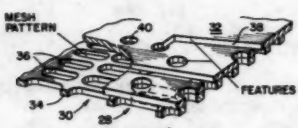
COATED MASK FOR PHOTOLITHOGRAPHIC CONSTRUCTION OF ELECTRIC CIRCUITS

Kie Y. Ahn, Chappaqua; Saryadevara Basavaiah, Mahopac; Stephen B. Brodsky, Monsey; Charles A. Cortellino, Wappinger Falls, and Joseph E. Levine, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,268

Int. Cl.[4] B32B *3/10*; B05D *3/06*; G03F *9/00*

U.S. Cl. 428—137 **11 Claims**



1. A mask for deposition of paste material in a predetermined format comprising:

a metallic substrate in the form of a thin foil having a thickness in the range of 0.001–0.006 inch;

a mesh formed in said metallic substrate and extending inwardly from a first exterior surface of the substrate;

a stencil formed in said metallic substrate and extending inwardly from a second exterior surface of said substrate opposite said first exterior surface, there being perforations in said mesh and in said stencil, perforations in said stencil communicating with predetermined ones of the perforations in said mesh for passage of paste material therethrough; and

a coating of a compound of nitrogen and an element of the fourth group of elements of the periodic table, said coating having a thickness of 2000–6000 angstroms; said coating being uniformly deposited on said substrate to provide lubricity and resistance to abrasion of said paste material within said mesh and within said stencil.

10. A method of coating a mask used in the construction of modular electric circuits by imprinting conductive paths on a base material, the method comprising the steps of:

constructing a mask substrate of a dimensionally stable material, the mask substrate being in the form of a thin foil having a thickness in the range of 0.001–0.006 inch and having apertures extending inwardly from a first surface to define a screen pattern and extending inwardly from a second surface to define a stencil pattern;

placing said mask substrate in front of and away from a source of a group IV element of the periodic table;

sputtering the group IV element of the periodic table onto the mask substrate;

simultaneously discharging nitrogen into a region of space permeated by the said sputtered element to provide a coating of nitrogen and said sputtered element upon the dimensionally stable material of said substrate;

directing the nitrogen away from said source, thereby to prevent contamination of the source and to preserve a uniform distribution of sputtering of the group IV element upon said mask substrate; and

terminating said sputtering upon attainment of a depth of said coating in the range of 2000–6000 angstroms, thereby providing a mask surface which is resistant to abrasion.

4,803,111

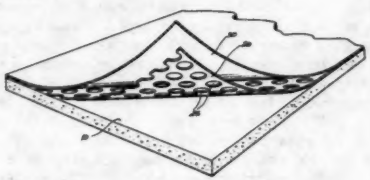
MEMBRANE ROOFING SYSTEM

William T. Mansell, Forestville, Australia, assignor to Chadwick Industries Pty. Limited, Lane Cove, Australia

Continuation of Ser. No. 769,693, Aug. 27, 1985, abandoned. This application Feb. 24, 1988, Ser. No. 163,133

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—139 **2 Claims**



1. An improved single layer membrane roofing or cladding arrangement for waterproofing a surface of a substrate, said substrate being a concrete roof, said arrangement comprising:

a synthetic single layer roofing membrane;

an underlay disposed intermediate said membrane and said surface of said concrete roof, said underlay being a thin flat non-bituminous perforated sheet of paper material; and

a contact adhesive fixing said membrane to said surface of said roof by adhesive contact, through said perforations, between said membrane and said surface of said roof,

non-perforated portions of said underlay presenting a surface of said underlay that is opposed to corresponding portions of said surface of said roof, said opposed surface of said underlay and said corresponding portions of said surface of said roof defining vapor dispersion paths through said arrangement during the effective life of said underlay.

4,803,112
IMPACT-CUSHIONING SHEETS AND DIRECT-APPLYING RESTRAINT TYPE FLOOR DAMPING STRUCTURES USING THE SAME

Hirofumi Kakimoto; Osamu Kiso, and Shinya Shimada, all of Fukuyama, Japan, assignors to Hayakawa Rubber Co., Ltd., Japan

Filed Apr. 17, 1987, Ser. No. 39,425
Claims priority, application Japan, Apr. 24, 1986, 61-93466; May 21, 1986, 61-114945; Jun. 16, 1986, 61-138114
Int. Cl.[4] B32B 3/00, 3/30
U.S. Cl. 428—161 9 Claims

1. An impact-cushioning sheet, comprising:
a film base constituted by alternately arranging convex portions having air enclosed therein and concave portions made only of a film; and
a crosslinked viscoelastic body filled in the concave portions of the film base and/or over the whole surface of the film base abd obtained by curing a viscoelastomeric substance at room temperature;
said crosslinked viscoelastic body retaining its shape even when being warmed at 80° C. and having a hardness at 20° C. of not more than 50 as measured by a C-type hardness tester according to a standard SRIS-0101 in The Society of Rubber Industry, Japan, wherein a ratio of total air volume in the convex portions of the film base to total viscoelastic body volume filled in the concave portions of the film base is within a range of convex portion: concave portion of 2:8 to about 8:2, and a height of the convex portion is not more than 6 mm.

4,803,113
CORRUGATED MICA PRODUCT

Dennis J. Sklarski, Deerfield, and Arthur F. Doyle, Portsmouth, both of N.H., assignors to Essex Group, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 782,259, Sep. 30, 1985, abandoned. This application Sep. 16, 1987, Ser. No. 97,575
Int. Cl.[4] B32B 15/02, 31/26
U.S. Cl. 428—182 3 Claims

1. A flexible corrugated mica insulation comprising one or more layers of mica paper impregnated with about 5 percent to about 25 percent by weight of a flexible polyxiloxane, said binder containing about 1 percent to about 4 percent by weight of an organic titanate and about 0.5 percent to about 2 percent by weight of a naphthenate wherein the mica insulation has improved moisture resistance, excellent flexibility and conformability.

4,803,114
PVC FILM FOR THE PRODUCTION OF IDENTITY CARDS

Martin Schledorn, Kirchehrenbach, Fed. Rep. of Germany, assignor to Internationale Octrooimaatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Dec. 15, 1986, Ser. No. 942,083
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544385
Int. Cl.[4] B32B 5/16, 9/00; C08K 3/04
U.S. Cl. 428—208 3 Claims

1. An identity card capable of being inscribed or marked with a laser beam which comprises a transparent top layer of polyvinyl chloride film containing 0.1 to 20 g of carbon black per 100 kg of polyvinyl chloride supported by an essentially nontransparent backing layer.

4,803,115
GLASS FIBER-REINFORCED ELECTRICAL LAMINATES AND A CONTINUOUS PRODUCTION METHOD THEREFOR

Yasuo Fushiki, Takatsuki; Minoru Isshiki, Otsu; Hiroshi Nakano, Ashiya; Masayuki Otzumi, Otsu; Masayoshi Shimomura, Shiga, and Keiji Imajo, Otsu, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 25, 1986, Ser. No. 911,531
Claims priority, application Japan, Sep. 27, 1985, 60-215998; Oct. 15, 1985, 60-230869; Oct. 15, 1985, 60-230870; May 16, 1986, 61-113211; May 16, 1986, 61-113212
Int. Cl.[4] B05D 5/00
U.S. Cl. 428—285 6 Claims

1. An electrical laminate comprising a cured assemblage of a plurality of glass fiber substrates impregnated with a curable resin composition consisting essentially of (a) 30 to 90 percent by weight of the entire resin composition of a mixture of an unsaturated polyester and a monomer for crosslinking said unsaturated polyester, the acid component and the glycol component of said unsaturated polyester consisting of an unsaturated polybasic carboxylic acid and a halogenated bisphenol A-ethylene or propylene oxide adduct, respectively; and (b) 10 to 70 percent by weight of an epoxy acrylate resin produced by reacting a polyepoxy compound with an equivalent quantity, relative to said epoxy compound, of acrylic or methacrylic acid.

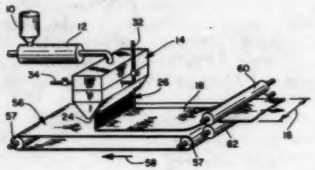
4,803,116
WATERPROOF FABRIC HAVING HIGH MOISTURE PERMEABILITY AND METHOD OF MAKING SAME

Jiro Amano, Takatsuki; Masato Shimada, Ohtsu; Kouzou Takano, and Shunroku Tohyama, both of Shiga, all of Japan, assignors to Toray Industries Incorporated, Tokyo, Japan

Filed Oct. 30, 1986, Ser. No. 925,709
Claims priority, application Japan, Oct. 31, 1985, 60-242960; Mar. 4, 1986, 61-45328; May 19, 1986, 61-112773
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—286 22 Claims

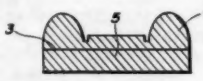
1. A waterproof fabric having a high moisture permeability and having an ultra-microporous continuous polymer coating having an average pore diameter in the range of between 50 Å and 0.2μ, said polymer having a monomer unit containing at least one acid radical selected from carboxyl group, sulfonic acid group, and alkali metal salts thereof.

4,803,117
COFORMED ETHYLENE-VINYL COPOLYMER ELASTOMERIC FIBROUS WEBS
Diego H. Daponte, Woodstock, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Continuation-in-part of Ser. No. 843,427, Mar. 24, 1986, abandoned. This application Mar. 13, 1987, Ser. No. 25,557
Int. Cl.[4] D04H 1/58
U.S. Cl. 428—228 22 Claims



1. A composite elastomeric web comprising:
meltblown elastomeric fibers formed from a copolymer of ethylene and at least one vinyl monomer selected from the group including vinyl ester monomers wherein said vinyl monomer comprises from about 10% to about 50%, by weight, of said copolymer; and
at least one type of secondary fiber uniformly distributed throughout said web.

4,803,118
COMPOSITE CUSHION
Hidehito Sogi, Aichi, and Toshiyuki Hori, Chiba, both of Japan, assignors to E. I Du Pont de Nemours and Company, Wilmington, Del. and Toyo Tire & Rubber Company, Osaka, Japan
Filed Apr. 8, 1988, Ser. No. 179,553
Int. Cl.[4] B32B 3/26, 7/00
U.S. Cl. 428—246 4 Claims



1. A composite cushion comprising at least two layers of foam having embedded therebetween at least one layer of fabric parallel to the planes of the foam layers, the fabric woven having a warp and a weft which are joined at the intersections, the fabric comprising a weft of elastomeric monofilament with a filament size of 0.125 mm–1.5 mm and a warp of yarn or elastomeric monofilament, the cushion having a spring function which is a composite of the individual components of the foam cushion.

4,803,119
INK COMPOSITIONS FOR IMPACT TYPEWRITER RIBBONS
James M. Duff, Mississauga; Stephan Drappel; James D. Mayo, both of Toronto, all of Canada, and Richard G. Crystal, Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 1, 1987, Ser. No. 56,172
Int. Cl.[4] B32B 3/26
U.S. Cl. 428—321.3 20 Claims

1. An impact printing ribbon comprised of a supporting substrate and a sponge with an ink composition dispersed therein, which ink is comprised of pigment particles and a dimer acid.

4,803,120
MAGNETIC TAPE HAVING A LEADER TAPE
Hiroshi Ogawa; Chiaki Mizuno, and Yasuo Tamai, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 750,129, Jul. 1, 1985, abandoned. This application Jul. 29, 1987, Ser. No. 80,153
Claims priority, application Japan, Jun. 29, 1984, 59-133009; Jun. 29, 1984, 59-133011
Int. Cl.[4] G11B 5/627
U.S. Cl. 428—323 11 Claims

1. A magnetic tape having a leader tape comprising a coating layer provided on one or both sides of a support, at at least one end of the magnetic tape, characterized in that the coating layer contains (a) an inorganic pigment powder with a grain size of 0.01 to 10 um and (b) a binder, in an amount of 25 to 600 parts per 100 parts of the powders, and the support is semi-transparent and is formed from a material selected from polyethylene terephthalate, polypropylene, polycarbonate and polyethylene naphthalate, and contains a white inorganic powder added as external grains, and has a haze of 40 to 80% and the leader tape has a percent photo-transmission of at least 20%.

4,803,121
MAGNETIC RECORDING MEDIUM
Katsumi Ryoke; Masatoshi Takahashi; Toshimitu Okutu, and Hideaki Kosha, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 16, 1987, Ser. No. 109,013
Claims priority, application Japan, Oct. 16, 1986, 61-244034
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—329 10 Claims

1. A magnetic recording medium comprising a non-magnetic support having thereon a magnetic layer comprising ferromagnetic fine particles, a binder, and α-alumina particles having an average size of from about 0.1 to 0.3 μm, provided that the number of α-alumina particles having a particle size of from 0.05 μm to 1.0 μm is at least equal to the number of α-alumina particles having a particle size of up to 0.05 μm, wherein the α-alumina particles have a specific surface area of from 5 to 50 m^2/g and the amount of the α-alumina particles is from about 2 to 12 wt % based on the ferromagnetic fine particles.

4,803,122
MULTILAYER LAMINATE OF SELF SUPPORTING FILMS
Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Division of Ser. No. 786,898, Oct. 11, 1985, Pat. No. 4,778,557. This application Feb. 27, 1987, Ser. No. 20,291
Int. Cl.[4] B32B 27/00, 27/32
U.S. Cl. 428—349 7 Claims

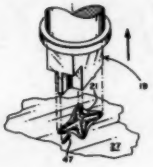
1. A laminate comprising:
(a) a first self-supporting outer film comprising a thermoplastic heat sealable material;
(b) a second self-supporting film comprising an oxygen barrier thermoplastic material, said second film adhered to the first film;

(c) a third self-supporting outer film comprising a thermoplastic heat sealable material; and
(d) wherein the lamiante has a thickness of at least about 10 mils, and at least one of the films is oriented.

4,803,123
PROCESS FOR PRODUCTION OF FIBROUS CARBON MATERIAL
Junzo Harada, Chiba, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan
Continuation of Ser. No. 939,573, Dec. 9, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 133,181
Claims priority, application Japan, Dec. 16, 1985, 60-281141
Int. Cl.[4] B05D 3/04
U.S. Cl. 428—367 1 Claim

1. A process for producing a fibrous carbon material from fibrous silicon carbide, said fibrous carbon material being of double structure in that the inside thereof near its core is silicon carbide and the outside thereof near its surface is carbon, said fibrous carbon material further being of essentially the same diameter and length as said fibrous silicon carbide but lighter in weight and having an average tensile modulus of 20.9 to 27.4 ton/mm^2, an average elongation of 1.28 to 1.67% and an average surface area of from 0.98×10^2 to 7.9×10^2 m^2/g, which comprises: charging said fibrous silicon carbide having an outer diameter of from 1.0 to 30μ and a length of from 10 to 40 mm to a reaction chamber; introducing an inert gas into said reaction chamber and adjusting the temperature therein to no greater than aobut 800° C.; while maintaining said temperature, contacting said fibrous silicon carbide with a halogen or halogen-containing compund for a period of time sufficient to remove the silicon therefrom at a silicon removal rate of 10 to 81%; replacing the halogen or halogen-containing compound with inert gas; lowering the temperature in said reaction chamber to about room temperature and removing the thus formed fibrous carbon material therefrom.

4,803,124
BONDING SEMICONDUCTOR CHIPS TO A MOUNTING SURFACE UTILIZING ADHESIVE APPLIED IN STARFISH PATTERNS
Rene Kunz, Mountain View, Calif., assignor to Alphasem Corporation, Sunnyvale, Calif.
Continuation of Ser. No. 2,267, Jan. 12, 1987, abandoned. This application Aug. 14, 1987, Ser. No. 85,355
Int. Cl.[4] B05D 1/14; B32B 31/00; B05C 3/02
U.S. Cl. 428—200 11 Claims



1. The combination comprising a mounting surface for bonding a semiconductor chip hereto, and a deposit of die attach adhesive material carried on said mounting surface for bonding the semiconductor chip thereto, said deposit being formed to spread across the bonding surface and provide full coverage of said bonding surface with a uniformly thick layer of adhesive free of voids in response to being compressed by a planar bonding surface of a chip moving normal to said mounting surface and disposed in parallel relation to the plane of the mounting surface, said deposit being of a substantially viscous material disposed and arranged in the general shape of a starfish having a plurality of radially extending arms, said shape being characterized by a raised central position disposed at the intersection of the radially inner ends of said plurality of arms, said arms being increasingly thickened progressively radially inwardly thereof to cause the deposit to spread symmetrically when compressed by a planar bonding surface of a die moving normally thereto while disposed in parallel relation to the plane of the mounting surface.

4,803,125
MAGNETIC RECORDING MEDIUM
Yoji Takeuchi, Kyoto, and Kenji Sumiya, Suita, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan
Filed Feb. 18, 1987, Ser. No. 16,081
Claims priority, application Japan, Feb. 18, 1986, 61-34890
Int. Cl.[4] G11B 5/72
U.S. Cl. 428—411.1 7 Claims

1. A magnetic recording medium comprising a substrate, a magnetic layer formed on one surface of said substrate and a back coating layer having a thickness of from 0.1 to 3.0 μm formed on the other surface of said substrate, wherein said back coating layer contains at least one polyfluoropolyether selected from the group consisting of a fluorinated polyether which comprises repeating units of the formula:

$$-(C_mF_{2m}O)- \quad (I)$$

wherein m is an integer of 1 to 18 and has, at least one molecular end, a polar group selected form the group consisting of polar groups of the formulae:

$$-COOR \quad (II)$$

$$-CONR_1R_2 \quad (III)$$

$$-C_nH_{2n}OH \quad (IV)$$

$$-C_nH_{2n}NR_1R_2 \quad (V)$$

$$-COC_nF_{2n+1} \quad (VI)$$

$$-C(OH)_2C_nF_{2n+1} \quad (VII)$$ ps

and

$$-CH_2OPO(OH)_2 \quad (VIII)$$

wherein R is a C_1–C_6 alkyl group or a benzyl or phenethyl group, R_1 and R_2 are the same and different, and each a hydrogen atom, a C_1–C_6 alkyl group, a benzyl or phenethyl group or a group of the formula: $-R_3OH$ wherein R_3 is a C_2–C_6 alkyl group, and n is an integer of 1 to 10 and a fluorinated polyether which comprises the repeating units of the formula (I) and has, at both molecular ends, polar groups of the formula:

$$-COO-(CH_2CH_2O)_l-PO(OH)_2 \quad (IX)$$

wherein l is an integer of 1 to 90, said polyfluoropolyether being contained in the back coating layer in an amount of from 0.01 to 10.0% by weight based on the total weight of solid components in the back coating layer.

4,803,126

PROCESS TO PERMIT IMPROVEMENT OF FUNCTIONAL PROPERTIES OF POLYOLEFIN ARTICLES BY ELECTRON-BEAM INITIATED POLYMERIZATION

John E. Wyman, Westford, Mass., assignor to Energy Sciences Inc., Woburn, Mass.

Filed Oct. 19, 1987, Ser. No. 110,472
Int. Cl.[4] B32B *9/04*
U.S. Cl. 428—447 10 Claims

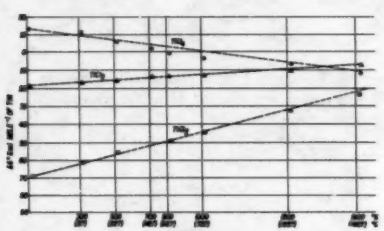
1. A process for modifying the surface of a polyolefin film and the like to increase the effective surface tension so as to permit adhesion thereto of a barrier coating, that comprises, hydrolyzing an organofunctional silane; coating the surface of a polyolefin film with the hydrolyzed silane and drying the same; and electron-beam irradiating the coated surface to initiate the further polymerization of the silane-to-silane structure in the hydrolyzed silane layer and also to graft the same to the polyolefin surface; and coating the silane-surface grafted polyolefin film with a polymer having the desired barrier properties.

4,803,127

VAPOR DEPOSITION OF METAL COMPOUND COATING UTILIZING METAL SUB-HALIDES AND COATED METAL ARTICLE

M. Javid Hakim, Burlington, Canada, assignor to Liburdi Engineering Limited, Ontario, Canada

Continuation of Ser. No. 943,871, Dec. 19, 1986, abandoned, which is a continuation of Ser. No. 788,701, Oct. 21, 1985, abandoned, which is a continuation of Ser. No. 577,225, Feb. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 469,857, Feb. 25, 1983, abandoned. This application Oct. 22, 1987, Ser. No. 111,144
Int. Cl.[4] B32B *15/04, 19/00*
U.S. Cl. 428—457 37 Claims



1. A method of producing metal compound coatings of one of the group of metals including titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum and tungsten on a substrate comprising:

(a) reacting in a reaction chamber in the presence of a substrate a gaseous mixture of the metal subchlorides with one member of the groups of gaseous mixtures comprising hydrogen and nitrogen; hydrogen, nitrogen and ammonia; hydrogen and a hydrocarbon; hydrogen, nitrogen and a hydrocarbon; and hydrogen, nitrogen, ammonia and a hydrocarbon;

(b) manipulating the free energy value for the reaction and the kinetic parameters of the reaction to facilitate a reaction temperature in the range of 250° to 850° C.;

(c) maintaining the reaction temperature of the substrate and the reaction chamber in the said reaction temperature range;

whereby the coating being one of the group of a metal nitride, and a metal carbide and a metal carbonitride is deposited on the substrate.

29. A coated article consisting essentially of:

(a) a metal compound coating of metal nitride, metal carbide or metal carbonitride; the metal being at least one of the metals from Group IVB, VB and VIB of the Periodic Table of the Elements; and the metal compound coating being formed using a metal subhalide and using hydrogen and not least one of nitrogen, ammonia or methane; and

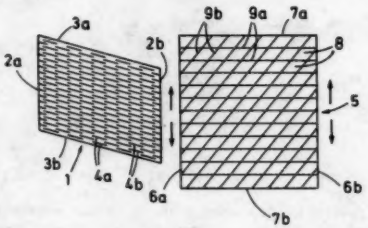
(b) the metal compound coating being deposited on and adhered to a metal substrate at a temperature below its softening point to avoid affecting its temper or hardness.

4,803,128

LATTICE

Ulrich Bender, Siegen, Fed. Rep. of Germany, assignor to Firma Emil Bender, Siegen, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,704
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629527
Int. Cl.[4] B21D *31/04*
U.S. Cl. 428—577 7 Claims



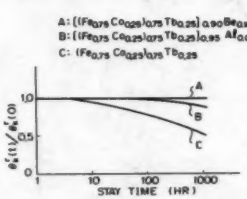
1. A lattice obtained by stretching a blank having a plurality of rows of slits, the lattice defining an edge and having webs which define rhomboid or rhomboidal openings, the webs extending obliquely relatively to the plane of the lattice, the major diagonal of the openings including an acute angle with the edge of the lattice, the major diagonals of the openings having such an angular position that always two webs which extend parallel to one another also extend parallel to the edge of the lattice, the webs located in the same row defining openings arranged one behind the other in the direction of the lattice edge being arranged so as to follow each other immediately and at least approximately in a straight line; wherein the blank has parallelogram or rhomboid shape, and wherein the rows of slits extend parallel to the edges of the lattice which extend at least approximately transversely or at an acute angle to the stretching direction of the blank.

4,803,129

MAGNETIC RECORDING MATERIAL

Naoshi Norisi, and Tadao Tokushima, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Continuation of Ser. No. 928,310, Nov. 6, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 133,183
Claims priority, application Japan, Nov. 9, 1985, 60-251797
Int. Cl.[4] G11B *7/24*
U.S. Cl. 428—694 1 Claim



1. An improved magnetooptic recording material comprising a composition defined by

$\{(Fe_aCo_b)_cTb_d\}_eBe_fTi_gAl_h$

in which a to h indicate atomic ratios, and a is in a range from 0.3 to 0.95, b is in a range from 0.05 to 0.7, C is in a range from 0.6 to 0.8, d is in a range from 0.2 to 0.4, e is in a range from 0.80 to 0.99, f is in a range from 0.01 to 0.20, g is in a range from 0.01 to 0.20 and h is in a range from 0.01 to 0.20.

4,803,130

REACTIVE SPUTTERING PROCESS FOR RECORDING MEDIA

Joseph Skorjanec, White Bear Lake, and Carmen D. Moe, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 684,735, Dec. 21, 1984, Pat. No. 4,729,924. This application Aug. 20, 1987, Ser. No. 87,260

Int. Cl.[4] G11B *5/64*

U.S. Cl. 204—192.2 **3 Claims**

1. A method of making a ferromagnetic recording medium comprising the steps of:

(i) coating a non-magnetic substrate material with a magnetic layer comprising a cobalt/chromium alloy having an atomic ratio of cobalt to chromium between about 75/25 and 90/10 by sputtering said alloy onto said substrate;

(ii) after sufficient thickness of the cobalt chromium alloy has been coated onto the substrate, introducing a gas selected from the group consisting of a hydrocarbon, nitrogen, ammonia, and oxygen into the sputtering process in order to deposit a layer of cobalt and chromium reaction products with such gas and operating the sputtering process under the following conditions:

(a) film growth rate of at least 50 angstroms per minute;

(b) conditions of sputtering set to fully react the cobalt and chromium being sputtered with the gas; and

(c) final thickness of said layer of cobalt and chromium reaction products being between about 40 and 300 Angstroms;

(iii) coating the layer of reaction products of cobalt and chromium with a lubricant useful for lubricating recording media.

4,803,131

MAGNETIC RECORDING MEDIUM

Shinji Saito; Hiroaki Araki; Kiyomi Ejiri; Hiroshi Ogawa, and Chiaki Mizuno, all of c/o Fuji Photo Film Co., Ltd., 12-1, Ogi-cho 2, Odawara-shi, Kanagawa, Japan

Filed Oct. 20, 1987, Ser. No. 110,317

Claims priority, application Japan, Oct. 20, 1986, 61-248862

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—694 **5 Claims**

1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer provided on the support which comprises a binder and a ferromagnetic powder dispersed therein, wherein said binder contains a resin component having an epoxy group in the range of 1×10^{-4} to 1×10^{-2} mols/g of said resin component, said resin component being selected from the group consisting of a vinyl chloride copolymer, a vinylidene chloride copolymer, a polyester resin, an acrylic resin, a polyvinyl acetal resin, a polyvinyl butyral resin, a phenoxy resin, a butadieneacrylonitile copolymer, and a polyurethane resin, and said ferromagnetic powder contains water in an amount corresponding to moles of 1–5 times as much as the number of moles of the epoxy group contained in the binder.

4,803,132

MAGNETIC RECORDING MEDIUM

Mikio Kishimoto, Osaka; Tetsuya Nakazumi, Ikeda; Tomoji Kawai, Minoo, and Shichio Kawai, Suita, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed May 8, 1987, Ser. No. 47,326

Claims priority, application Japan, May 9, 1986, 61-106372

Int. Cl.[4] G11B *5/706*

U.S. Cl. 428—141 **6 Claims**

1. A magnetic recording medium which comprises a non-magnetic substrate and a magnetic layer formed thereon, said magnetic layer containing a magnetic powder and a binder, said magnetic powder comprising a nuclear crystal consisting of magnetic oxide powder and a magnetic metallic layer formed thereon containing cobalt, said magnetic layer having a coercive force of not more than 1,000 Oe, a saturation magnetic flux density of not less than 1,800 gauss and a saturation magnetization of not less than 80 emu/g.

4,803,133

MAGNETIC RECORDING MEDIUM

Hozumi Hirota, Yamatokoriyama; Yukihiro Shimasaki, Katano; Hideaki Komoda, Hirakata, and Ikuo Ota, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 8, 1987, Ser. No. 130,299

Claims priority, application Japan, Dec. 26, 1986, 61-312228; Jan. 12, 1987, 62-4377; Jan. 12, 1987, 62-4378

Int. Cl.[4] G11B *5/71*

U.S. Cl. 428—695 **1 Claim**

1. A magnetic recording medium comprising a support body and a magnetic layer formed on the support body, said magnetic layer including magnetic powder, oleic acid and a first ester selected from a group consisting of ethyl stearate and ethyl oleate, and a second ester selected from a group consisting of isocetyl stearate, 2-ethyl hexyl stearate and 2-ethyl hexyl laurate, wherein the compounding ratio of the oleic acid and the total amount of the first and second esters is 1:2 to 1:8 by weight, and the total amount of the oleic acid, the first ester and the second ester is 5 to 15% by weight with respect to the magnetic powder.

4,803,134

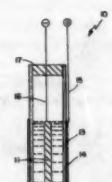
HIGH ENERGY DENSITY LITHIUM-OXYGEN SECONDARY BATTERY

Anthony F. Sammells, Naperville, Ill., assignor to Eltron Research, Inc., Aurora, Ill.

Filed Jun. 24, 1987, Ser. No. 65,967

Int. Cl.[4] H01M *8/14, 4/00, 4/36*

U.S. Cl. 429—16 **20 Claims**



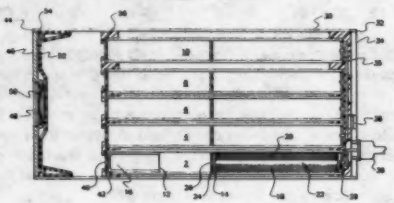
1. A high energy density lithium-oxygen secondary cell comprising a lithium-containing negative electrode; a lithium ion conducting molten salt electrolyte contacting said negative electrode; an oxygen ion conducting solid electrolyte contacting and containing said molten salt electrolyte; and an oxygen redox positive electrode contacting said oxygen ion conducting solid electrolyte.

4,803,135

PRESSURE ACTIVATED RESERVE BATTERY

Kurt F. Garoutte, Furlong, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 29, 1988, Ser. No. 161,556
Int. Cl.[4] H01M 6/34
U.S. Cl. 429—116 7 Claims



1. A reserve pressure compensating battery comprising at least one reserve cell which contains a means for storing a pair of cell electrodes and an electrolyte reservoir, separated by a fluid-tight barrier,

a first rupturable seal means for providing a rupturable fluid-tight barrier between the cell electrodes and the cell electrolyte reservoir, said barrier being arranged to connect the cell electrodes and the cell electrolyte reservoir through an appropriate opening,

a second rupturable seal means across an external end of the cell electrolyte reservoir means,

a deformable cup means within the electrolyte reservoir means, having the closed cup end facing said second rupturable seal means and an open end facing first seal means with a wall of said cup being integrally attached to the outer reservoir and cell wall means to provide a fluid-tight seal therewith,

a housing means surrounding said reserve cell and having an opening therein,

a third rupturable seal means across said opening in said housing means,

a flexible bladder means in said housing means for isolating said third seal means from said second seal means and

an electrically nonconductive fill fluid within said housing means between said bladder means and said second seal means whereby a movement of said bladder means allows an internal pressure of said fill fluid to match an external environmental pressure to minimize pressure resistance of said housing means.

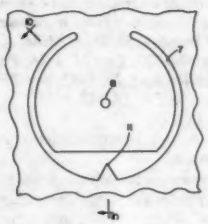
4,803,136

METHOD OF MANUFACTURING A SAFETY VENTED CONTAINER AND PRODUCT

Benjamin Bowsky, Maineville; Glenn A. Honkomp, Loveland; Larry G. Burrows, Cincinnati, and Edward E. Wilson, Milford, all of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 782,048, Sep. 30, 1985, abandoned, and a continuation-in-part of Ser. No. 909,302, Sep. 19, 1986, abandoned. This application Apr. 23, 1987, Ser. No. 41,478
Int. Cl.[4] H01M 2/12; C23F 1/00; B44C 1/22
U.S. Cl. 429—56 30 Claims

1. A method of making a safety vent in a portion of an hermetically sealed container for an electrochemical device, the safety vent being capable of withstanding a preselected pressure before profoundly rupturing with the metal adjacent the rupture remaining attached to an initial portion of said container portion for effective pressure relief, comprising: feeding said container portion having initial stress and grain characteristics into a printing zone; printing said container portion while in said printing zone with a masking resist pattern having an uncovered preselected planar strip-like area having preselected length and breadth to correspond to a safety vent area; feeding said masked printed container portion to an etching zone; subjecting said container portion while in said etching zone to a controlled etching process using preselected etching materials to etch said uncovered preselected planar area to a uniform preselected depth to leave a uniform preselected remaining material thickness throughout the etched planar area having said preselected length and breadth to be in the form of a flat membrane having stress and grain characteristics substantially like said initial stress and grain characteristics, said remaining materials of said etched planar area formed as said flat membrane being of uniform thickness and preselected surface area to have a controlled and uniform pressure sensitivity of substantially unchanged residual stress to serve as a safety vent and, feeding said uniformly etched



container portion through a rinsing zone to remove said etching materials.

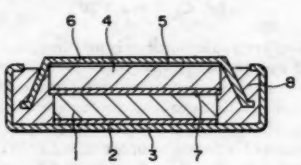
18. A container portion for a hermetically sealed container for an electro-chemical device, having at least one planar area chemically etched therein to provide a safety vent of preselected uniform thickness with stress and grain characteristics substantially like the stress and grain characteristics of the remaining material of said container portion in the form of a flat membrane to have a controlled and uniform pressure sensitivity of substantially unchanged residual stress capable of uniformly responding to and withstanding a preselected pressure before profoundly rupturing under preselected pressure with the metal adjacent the ruptured flat membrane safety vent remaining attached to said container portion.

4,803,137

NON-AQUEOUS ELECTROLYTE SECONDARY CELL

Tadaaki Miyazaki, Higashiyamato; Takao Ogino, Tokorozawa; Yoshitomo Masuda, Tachikawa, and Takahiro Kawagoe, Tokorozawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,995
Claims priority, application Japan, May 19, 1987, 62-120216; Jun. 5, 1987, 62-141258
Int. Cl.[4] H01M 6/14
U.S. Cl. 429—194 4 Claims



1. A non-aqueous electrolyte secondary cell comprising a positive electrode active material selected from materials represented by formulae (I) through (6):

$$Li_xMo_2V_{2-x}O_5 \quad (I)$$

$Li_xW_xV_{2-x}O_5$ (2)

$Li_yMo_zV_{2-z}O_5$ (3)

$Li_yW_zV_{2-z}O_5$ (4)

$Li_{m+n}Mo_mW_nV_{2-m-n}O_5$ (5)

β-$Li_qV_2O_5$ (6)

wherein $x \leqq 1$, $z < y \leqq 1$, $m+n \leqq 1$, and $0.1 \leqq q \leqq 0.6$,

a negative electrode active material of lithium or a lithium alloy capable of occluding and releasing lithium, and

an electrolyte consisting essentially of a non-aqueous material which allows lithium ions to migrate for electrochemical reaction with said positive electrode active material.

4,803,138

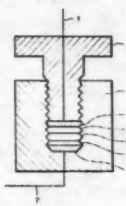
NONAQUEOUS SECONDARY BATTERY

Yukio Kobayashi, Saganihara; Masataka Takeuchi, Yamato; Mutsumi Kameyama, Hatogaya; Manabu Ohira; Yoshikazu Kikuta, both of Kawasaki, and Toyohiko Takahashi, Yokohama, all of Japan, assignors to Showa Denko K.K. & Hitachi, Ltd., Tokyo, Japan

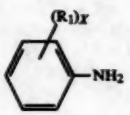
Filed Mar. 14, 1988, Ser. No. 168,046

Int. Cl.[4] H01M 4/60, 6/14

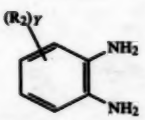
U.S. Cl. 429—194 **15 Claims**



1. A nonaqueous secondary battery which comprises a positive electrode composed of a polymer obtained by oxidative polymerization of at least one aniline compound selected from the group consisting of compounds represented by the following formulae (1) and (2):

 (1)

and

 (2)

wherein R_1 and R_2 stand for an alkyl group having 1 to 5 carbon atoms or an alkoxy group having 1 to 5 carbon atoms, and X and Y are 0, 1 or 2,

or a reduction product of said polymer, a negative electrode composed of (i) an alkali metal, (ii) an alkali metal alloy, (iii) an electroconductive polymer or (iv) a composite of an electroconductive polymer with an alkali metal or an alkali metal alloy, and an electrolytic solution comprising a supporting electrolyte selected from the group consisting of $LiAsF_6$, $LiBF_4$ and $LiPF_6$ and a solvent, wherein when the supporting electrolyte is $LiAsF_6$ or $LiPF_6$, the solvent is a mixed solvent comprising at least one member selected from the group consisting of propylene carbonate and ethylene carbonate and at least one member selected from the group consisting of tetrahydrofuran and 1,2-dimethoxyethane, and when the supporting electrolyte is $LiBF_4$, the solvent is a mixed solvent comprising propylene carbonate, ethylene carbonate and at least one member selected from the group consisting of tetrahydrofuran and 1,2-dimethoxyethane.

4,803,139

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

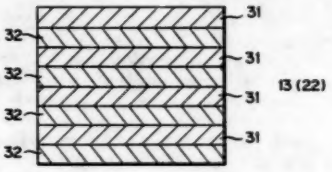
Shuji Yoshizawa, and Tatsuya Ikezue, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jul. 30, 1987, Ser. No. 79,763

Claims priority, application Japan, Aug. 11, 1986, 61-188316

Int. Cl.[4] G03G 5/082, 5/14

U.S. Cl. 430—57 **17 Claims**



1. An electrophotographic photoreceptor comprising:

a conductive substrate; and

a photoconductive layer, disposed on said substrate, for generating photocarriers upon irradiation with light, said photoconductive layer having a superlattice portion of two types of alternating semicondcutor layers comprised of amorphous silicon, said tyes differing is carbon content for each other, wherein each of said semiconductor layers (i) contains hydrogen and carbon, and (ii) has a thickness of between about 30 and 500 Å.

4,803,140

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Masaaki Hiro, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 775,766, Sep. 18, 1985, abandoned. This application Oct. 15, 1987, Ser. No. 110,088

Claims priority, application Japan, Sep. 20, 1984, 59-195840

Int. Cl.[4] G03G 5/14

U.S. Cl. 430—58 **4 Claims**

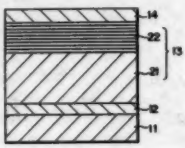
1. An electrophotographic photosensitive member having a photosensitive layer on an electroconductive substrate, said photosensitive layer having a laminated structure comprising a charge generation layer containing an organic photoconductive charge generation material and a charge transport layer containing an organic charge transport material having aromatic rings in the molecule, said charge transport layer being coated on the charge generation layer said charge transport layer containing a polymer formed from a polymerizable monomer having, in the side chain, an aromatic ring substituted with fluorine atom as the constituent.

4,803,141

ELECTROPHOTOGRAPHIC SUPERLATTICE PHOTORECEPTOR

Shuji Yoshizawa, and Tatsuya Ikezue, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jul. 30, 1987, Ser. No. 79,463
Claims priority, application Japan, Aug. 11, 1986, 61-188317; Aug. 11, 1986, 61-188318
Int. Cl.[4] G03G 5/082, 5/14
U.S. Cl. 430—58 17 Claims



1. An electrophotographic photoreceptor comprising:
a conductive substrate; and
a photoconductive layer disposed on said substrate, said photoconductive layer including a charge-generating layer for generating photocarriers upon irradiation with light and a charge-transporting layer for transporting the photocarriers generated from said charge-generating layer, said charge-transporting layer comprising amorphous silicon containing hydrogen, said charge-generating layer having a superlattice portion of alternately stacked first semiconductor layers comprised of amorphous silicon containing hydrogen and second semiconductor layers comprised of microcrystalline silicon containing hydrogen and carbon, each of said first and second semiconductor layers having a thickness of between about 30 and 500 Å.

4,803,142

CONTAINING MAGNETIC PARTICLES HAVING A BULK RESISTIVITY OF AT MOST 10^4 OHM.CM AND A POWDER RESISTIVITY OF 10^5-10^{12} OHM.CM

Seiichi Takagi, Yokohama, and Hiroshi Fukumoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1986, Ser. No. 922,310
Claims priority, application Japan, Oct. 28, 1985, 60-240755
Int. Cl.[4] G03G 9/14
U.S. Cl. 430—106.6 17 Claims

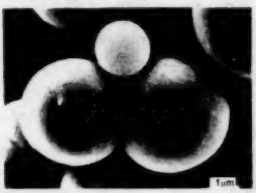
1. A magnetic toner composition, comprising: a binder resin and a particulate magnetic material comprising metallic iron and iron fluoride, said magnetic particles being less than about 1.0 μm and having a bulk resistivity of 10^4 Ω-cm or less and a powder resistivity of $10^5$10^{12} Ω-cm, wherein said magnetic toner composition has a magnetic material content W of from 20–60 wt. %, a saturation magnetization σ_s of W emu/g or higher as measured at a magnetic filed of 10 k Oe and a bulk resistivity of 10^{13} Ω-cm or higher.

4,803,143

COLORED SINGLE-COMPONENT TONERS AND THEIR PREPARATION

Werner Oftertag, Gruenstadt; Erwin Czech, Darmstadt; Franz-Ulrich Schmitt, Gerlingen, and Detlef Schulze-Hagenest, Stuttgart, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,312
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542834
Int. Cl.[4] G03G 9/08, 9/14
U.S. Cl. 430—106.6 5 Claims



1. A colored single-coponent toner consisting essentially of a magnetic pigment, a binder based on an organic polymer and-/or wax, a dye or colored pigment homogeneously dispersed in the binder, wherein the magnetic pigment consists of iron powder whose particles range in shape from spherical to elliptical and are from 2 to 12 μm in size.

4,803,144

ELECTROPHOTOGRAPHIC ENCAPSULATED PRESSURE FIXABLE TONER PARTICLES WITH ELECTROCONDUCTIVE POWDER COATING

Noriyuki Hosoi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 758,570, Jul. 24, 1985, abandoned, which is a continuation of Ser. No. 433,712, Oct. 12, 1982, abandoned. This application Feb. 19, 1987, Ser. No. 16,962
Claims priority, application Japan, Oct. 16, 1981, 56-165265
Int. Cl.[4] G03G 9/14
U.S. Cl. 430—106.6 9 Claims

1. An electrostatographic toner material comprising encapsulated toner particles having an average particle size in the range from about 0.5 to about 1,000 microns, in which the toner particle comprises a pressure fixable adhesive core material containing colorant and magnetizable substance and a pressure rupturable shell enclosing the core material, the outer surface of the shell being provided with a white powder of electroconductive stannic oxide selected from the group consisting of SnO_2 doped with 0.01–30 molar % of a donner atom selected from the group consisting of antimony, niobium, and halogen, and a combination of SnO_2 and one or more electroconductive metal oxides selected from the group consisting of oxides of zinc, titanium, aluminum, indium, silicon, magnesium, barium and molybdenum.

4,803,145

LIGHT SENSITIVE ALKALI DEVELOPABLE PHOTORESIST MATERIAL WITH FLUORINE SURFACTANT CONTAINING COLOR LAYER

Tamotsu Suzuki; Fumiaki Shinozaki; Akira Nishioka, and Mikio Totsuka, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1987, Ser. No. 31,737
Claims priority, application Japan, Mar. 28, 1986, 61-70019
Int. Cl.[4] G03C 1/74, 1/54, 1/68
U.S. Cl. 430—166 8 Claims

1. A light-sensitive image-forming material comprising a support having provided thereon a coloring layer having a

thickness of about 0.1 to 10 μm comprising a coloring agent and an alkali soluble organic maromolecular binder, said coloring agent being present in an amount of from 1–100 wt % based on the weight of said binder, and an alkali developable photoresist layer, in the order listed, wherein said coloring layer further contains from 0.01 to 12 wt % based on coloring layer constituents (as solids) of a fluorine-containing surface active agent which isa copolymer comprising as repeating units (1) an acrylate or a methacryalte which has a fluorinated aliphatic group containing from 3 to 20 carbon atoms and not less than 40 wt % of fluorine atoms, said aliphatic group having a terminal moiety containing at least 3 fluorinated carbon atoms, adn (2) a poly(oxyalkylene) acrylate or a poly(oxyalkylene)methacrylate, wherein said fluorinated aliphatic group-containing acrylate or methacrylate repeating unit consititutes from 10 to 70 wt % based on said copolymer, and said copolymer has a molecular weight ranging from 2,500 to 100,000.

4,803,146

METHOD TO FORM IMAGE FOR SILVER SALT DIFFUSION TRANSFER USING FOGGING AGENT

Noriyuki Inoue; Yoshio Idota, and Morio Yagihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 20, 1987, Ser. No. 110,300

Claims priority, application Japan, Oct. 20, 1986, 61-248967

Int. Cl.[4] G03C *5/54*

U.S. Cl. 430—248 **9 Claims**

1. A method for forming an image for diffusion transfer of silver salts comprising image-wise exposing a diffusion transfer photographic film material comprising at least one support, at least one surface latent image type silver halide photographic emulsion layer and at least one image-receiving layer, and developing the image-wise exposed at least one surface latent image type silver halide emulsion layer with an aqueous alkaline processing solution comprising a silver halide developing agent and a silver halide solvent in the presence of a fogging agent.

4,803,147

PHOTOSENSITIVE POLYIMIDE POLYMER COMPOSITIONS

Werner H. Mueller, E. Greenwich; Dinesh N. Khanna, and Rohitkumar H. Vora, both of W. Warwick, all of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 24, 1987, Ser. No. 124,742

Int. Cl.[4] G03C *1/68*

U.S. Cl. 430—288 **16 Claims**

1. A photosensitive polyimide composition consisting essentially of solvent soluble polyimide which is the condensation product of an aromatic diamine and an aromatic dianhydride; a photoinitiator; a photopolymerizable compound containing at least two terminal ethylenically unsaturated groups; wherein at least one of said dianhydride or said diamine is selected from 2,2-hexafluoro-bis(3,4-dicarboxyphenyl)propane dianhydride; 2,2-hexafluorobis(3-aminophenyl)propane; 2,2-hexafluoro-bis(4-aminophenyl)propane; 2,2-hexafluoro-bis[4-(3-aminophenoxy)phenyl]propane; 2,2-hexafluoro-bis[4-(4-aminophenoxy)phenyl]propane; 1,1-bis(4-aminophenyl)-1-phenyl-2,2-2-trifluoroethane; 1,1-bis-[4-(1,2-dicarboxyphenyl)]-1-phenyl-2,2,2-trifluoroethane dianhydride and mixtures thereof.

4,803,148

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND

Toru Harada, and Kozo Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

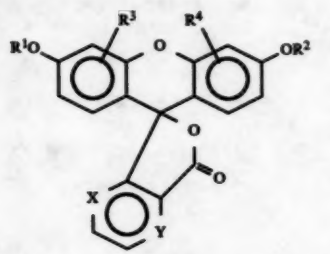
Filed Jun. 9, 1987, Ser. No. 59,991

Claims priority, application Japan, Jun. 9, 1986, 61-133092

Int. Cl.[4] G03C *5/54, 1/68*

U.S. Cl. 430—138 **7 Claims**

1. A light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent, an ethylenic unsaturated polymerizable compound and a leuco dye provided on a support, wherein the leuco dye is a compound having the following formula (IV):



(IV)

in which one of X and Y is nitrogen and the other is carbon; R^1 and R^2 are the same groups selected from the group consisting of an alkyl group and a cycloalkyl group; R^3 and R^4 are the same groups selected from the group consisting of an alkyl group, a cycloalkyl group and an alkoxy group; and the sum of carbon atoms contained in the groups of R^1 and R^3 is not less than 5.

4,803,149

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Toshiro Takahashi; Ken-ichi Kuwahara, and Masahiro Okada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 6, 1986, Ser. No. 915,593

Claims priority, application Japan, Oct. 4, 1985, 60-221498

Int. Cl.[4] G03C *1/36, 5/26*

U.S. Cl. 430—264 **12 Claims**

1. A silver halide photographic material for a bright room comprising a support having thereon at least one silver halide emulsion layer containing silver chloride grains or silver chlorobromide grains containing at least 80 mol% silver chloride, at least one of said silver halide emulsion layer or another hydrophilic colloid layer(s) present containing a yellow dye making the silver halide photographic material substantially insensitive to visible light of 420 n.m. or more and an ultraviolet absorbent in an amount sufficient to reduce the specific sensitivity of the silver halide emulsion at 360 n.m. to $\frac{1}{4}$ or lower than $\frac{1}{4}$ thereof in the absence of the ultraviolet absorbent, and the γ value of the silver halide photographic material being at least 10.

4,803,150

RADIOGRAPHIC ELEMENT EXHIBITING REDUCED CROSSOVER

Robert E. Dickerson, Rochester; James E. Kelly, Pittsford; Donald R. Diehl, and Ronda E. Factor, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 137,490, Dec. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 104,468, Oct. 5, 1987, abandoned. This application Jul. 13, 1987, Ser. No. 73,256

Int. Cl.[4] G03C *5/16, 1/46, 7/26, 7/32*

U.S. Cl. 430—502 **10 Claims**

1. A radiographic element comprised of

a film support capable of transmitting radiation to which said radiographic element is responsive having opposed major faces,

processing solution permeable hydrophilic colloid layers including, coated on each opposed major face, at least one silver halide emulsion layer capable of responding to electromagnetic radiation in the visible portion of spec-

trum and at least one other hydrophilic colloid layer interposed between said emulsion layer and said support, a dye dispersed in at least one of said interposed hydrophilic colloid layers capable of (i) absorbing visible radiation to which said radiographic element is responsive to reduce crossover and (ii) being decolorized in a processing solution,

characterized in that

said dye is prior to processing in the form of microcrystalline particles present in a concentration sufficient to reduce crossover to less than 10 percent and is capable of being substantially decolorized in less than 90 seconds during processing.

4,803,151

PHOTOGRAPHIC MATERIAL FOR THE SILVER DYE BLEACH PROCESS COMPRISING AN AZO DYE, CAPABLE OF LAKING, IN GELATINE

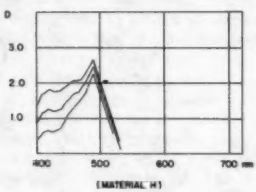
Rolf Steiger, Praroman, and Matthias Schellenberg, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 11, 1987, Ser. No. 13,419

Claims priority, application Switzerland, Feb. 11, 1986, 536/86

Int. Cl.[4] G03C *7/32*

U.S. Cl. 430—562 **16 Claims**



1. A photographic material for the silver dye bleach process, which comprises, in at least one layer, a colloidal dispersion of water-insoluble salts of water-soluble azo dyes, capable of laking, in gelatin, the colloidal particles having a size of 0.01 to 1 m and the ratio of azo dye to gelatin being 1:1 to 1:10 the colloidal dispersion being obtained by reacting the azo dyes with at least the stoichiometric quantity of divalent or trivalent inorganic metal salts in the presence of gelatin.

4,803,152

SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING NOVEL CHLORIDE CONTENT

Yasuhito Momoki, and Kazunori Hasebe, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

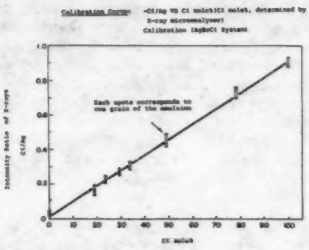
Filed Jun. 5, 1987, Ser. No. 58,712

Claims priority, application Japan, Jun. 5, 1986, 61-130739

Int. Cl.[4] G03C *1/02, 7/23*

U.S. Cl. 430—567 **18 Claims**

1. A negative-working photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, wherein said silver halide emulsion layer comprises a silver chlorobromide emulsion which is substantially free of iodide and has a chloride content which satisfies the following relationship (I) between the mean mole% of silver chloride in grain group (A), in which the grains have sizes not less than the median size in the grain size distribution of said silver halide emulsion, and the mean mole% of silver chloride



in grain group (B) in which the grains have sizes less than the median size:

Relationship (I): $3 \leqq$ [Mean mole% of silver chloride in grain group (A)] − [Mean mole% of silver chloride in grain group (B)] $\leqq 50$.

4,803,153

PROCESS FOR SEPARATING BLOOD SERUM FROM BLOOD

Toshiko Shibata, Ichikawa; Hiroji Ina, Tama, and Kazuo Ina, Shizuoka, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Mar. 18, 1986, Ser. No. 841,096

Claims priority, application Japan, Mar. 19, 1985, 60-53328

Int. Cl.[4] B01D *21/01;* A01N *1/02*

U.S. Cl. 435—2 **2 Claims**

1. A process for the separation of blood serum from blood, which comprises (a) placing at least one compound selected from the group consisting of d-sesamin, l-sesamin, paulownin, d-asarinin, l-asarinin, 2α-paulownin, 6α-paulownin, pinoresinol, d-eudesmin, l-pinoresinol β-D-glucoside, l-pinoresinol, l-pinoresinol monomethyl ether β-D-glucoside, epimagnolin, lirioresinol-B, syringaresinol (dl), lirioresinonB-dimethyl ether, phillyrin, magnolin, lirioresinol-A, 2α, 6α-d-sesamin, d-diaeudesmin, lirioresinol-C dimethyl ether (ddiayangambin) and sesamolin in a test tube which is used for separation of blood serum, and (b) placing blood into said test gube.

4,803,154

MULTI-SPOT ENZYME IMMUNOASSAY METHOD

Junko Uo; Masaji Nishimura; Kazuo Horiguchi; Setsuko Nakanishi, and Shigeru Kaku, all of Kyoto, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 25, 1986, Ser. No. 856,018

Claims priority, application Japan, Apr. 25, 1985, 60-90216

Int. Cl.[4] G01N *33/53*

U.S. Cl. 435—7 **12 Claims**

1. In a method for the assay of an immunologically active substance (B) in a biologically derived test sample comprising contacting a prefixed amount of an immunologically active substance (A) specifically reactive with the substance (B), which is immobilized on a solid carrier, with the test sample containing the substance (B) in the presence of an enzyme-labelled immunologically active substance (A'), and colorimetrically measuring the amount of the enzyme contained in the enzyme-labelled substance (A') bound to the substance (B) bound to the immobilized substance (A), the improvement which comprises:

(a) preparing an immuno-active membrane of a hydrophobic polymer sheet having a number of hydrophilic spots, on

which a prefixed amount of an immuno-active substance (A) has been immobilized,

(b) preparing a coloring-membrane having a number of spots which contain a color-producing reagent being capable of developing color by the catalytic effect of an enzyme at the corresponding positions to those of the immuno-active membrane,

(c) contacting the immuno-active membrane from (a) with said test sample together with an enzyme-labelled immuno-active substance (A'), simultaneously or successively, thereby reacting the substance (A), substance (B) and enzyme-labelled substance (A') non-competitively,

(d) adding dropwise a mixture containing a substrate to each spot of the immuno-active membrane of (c), and

(e) superposing the coloring-membrane of (b) on the immuno-active membrane of (d), so that the spots in both membranes correspond to each other, and

(f) colorimetrically measuring the resulting color and thereby determining the amount of the substance (B) in the test sample.

4,803,155

MONOCLONAL ANTIBODIES TO *SCLEROTINIA HOMOEOCARPA*

Frank P. Petersen, Beverly; Adrianna M. Maybroda, Haddonfield, and Sally A. Miller, Pennsauken, all of N.J., assignors to Agri-Diagnostics Associates, Cinnaminson, N.J.

Filed Feb. 27, 1986, Ser. No. 834,198

Int. Cl.[4] G01N *33/53*, *33/577*; C07K *15/14*

U.S. Cl. 435—7 **22 Claims**

1. A monoclonal antibody capable of specifically binding with an antigen from *Sclerotinia homoeocarpa*.

4,803,156

PEPTIDE-BETA-LACTAMASE CONJUGATES FOR ENZYME-LINKED IMMUNOASSAYS

Alexander R. Neurath, New York, N.Y.; Stephen B. H. Kent, Pasadena, Calif., and Nathan Strick, Far Rockaway, N.Y., assignors to New York Blood Center, New York, N.Y. and California Institute of Technology, Pasadena, Calif.

Filed Sep. 11, 1985, Ser. No. 774,829

Int. Cl.[4] G01N *33/53*

U.S. Cl. 435—7 **10 Claims**

1. A reagent for an ELISA determination of antibodies specific for the pre-S region of the hepatitis B virus envelope protein, the reagent comprising a peptide covalently linked to beta-lactamase, wherein said peptide is a synthetic peptide having an amino acid sequence corresponding to a sequence of amino acids in the pre-S region of the hepatitis B virus envelope protein and wherein said peptide mimics an antigenic determinant of said protein.

7. A reagent for an ELISA determination of antibodies specific for HTLV III/LAV, the reagent comprising a peptide covalently linked to beta-lactamase, wherein said peptide being a synthetic peptide having an amino acid sequence corresponding to a sequence of amino acids in HTLV III/LAV and wherein said peptide mimics an antigenic determinant of HTLV III/LAV.

4,803,157

HYDROLYZABLE FLUORESCENT SUBSTRATES FOR PHOSPHATASES AND ANALYTICAL USE THEREOF

Michael W. Sundberg, Penfield; Bruce Babb, and Gregory McClune, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 31, 1986, Ser. No. 824,752

Int. Cl.[4] F12Q *1/42*; C07F *9/02*

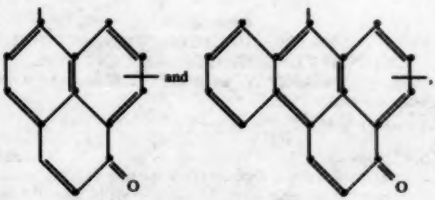
U.S. Cl. 435—21 **16 Claims**

1. A hydrolyzable compound represented by the formula:

BLOCK—X—R/—L

wherein BLOCK is phosphono, thioxophosphono or a salt thereof, X is —O—, —S— or —NR— wherein R is hydrogen or alkyl, provided that when BLOCK is thioxophosphono, X is —O—,

R/ is a phenalenone or benzphenalenone moiety selected from the group consisting of



provided that when released as —X—R/—L, —X—R/—L exhibits maximum fluorescent emission at least about 580 nm and maximum absorption above about 530 nm, and L is hydrogen or a specific binding ligand.

4,803,158

COMPOSITION USED FOR THE DETERMINATION OF BETA-HYDROXYBUTYRIC ACID AND A METHOD FOR PREPARING THE SAID COMPOSITION

Yukio Shigeta, Hyogo; Yutaka Harano, Shiga; Shigeki Yamada, Kyoto, and Yoshinori Takahashi, Fukui, all of Japan, assignors to Kabushiki Kaisha Kyoto Daiichi Kagaku and Kabushiki Kaisha Sanwa Kagaku Kenkyusho, both of, Japan

Continuation-in-part of Ser. No. 582,059, Feb. 21, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 922,178

Claims priority, application Japan, Mar. 8, 1983, 58-39813

Int. Cl.[4] C12Q *1/32*, *1/26*

U.S. Cl. 435—25 **3 Claims**

1. A test indicator consisting essentially of:

(a) a composition for determining beta-hydroxybutyric acid in a liquid, said composition consisting essentially of a single pH buffer for maintaining pH within the range of 7 to 9, beta-hydroxybutyric acid dehydrogenase, NAD (Nicotinamide adenine dinucleotide), diaphorase, and nitro-TB and a binder comprising a natural or synthesized film-forming polymer; and

(b) a water-impermeable substrate on which said composition is applied;

said indicator being a one-layered indicator on said substrate.

4,803,159

ANALYTICAL ELEMENT AND METHOD FOR DETERMINATION OF TOTAL LACATE DEHYDROGENASE

Margaret J. Smith-Lewis, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 740,163, Jun. 3, 1985, abandoned. This application Apr. 7, 1986, Ser. No. 848,613

Int. Cl.[4] C12Q *1/26*; G01N *21/77*, *1/00*, *21/00*

U.S. Cl. 435—26 **19 Claims**

1. A dry analytical element for the determination of total lactate dehydrogenase (LDH) comprising a support having thereon

a porous spreading layer composed of a particulate structure comprising a plurality of particles being bonded to each other on surface areas of said particles which are adjacent, where said adjacent particles form a coherent, three dimensional lattice which is essentially non-swellable to an aqueous liquid,

said element further comprising a saturated or unsaturated fluorinated surfactant containing one or more fluorocar-

bon moieties each having from 4 to 16 carbon atoms and from 8 to 33 fluorine atoms, and each of said moieties having a ratio of fluorine atoms to carbon atoms of about 2:1, provided that when said surfactant contains more than one such moiety, said moieties have up to two fluorinated or unfluorinated methyl branches.

4,803,160

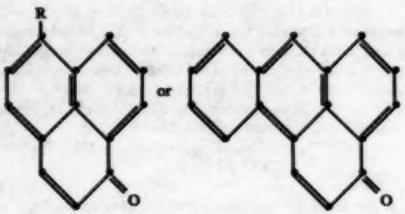
USE OF POLYMERIC MORDANTS TO INCREASE THE INTENSITY OF RIGID FLUORESCENT DYES

Annie L. Wu, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 31, 1986, Ser. No. 824,755
Int. Cl.[4] C12Q 1/02
U.S. Cl. 435—29 **24 Claims**

1. An analytical dye composition comprising a rigid phenalenone, benzphenalenone or 4-oxo-4H-benz-[d,e]anthracene fluorescent dye or a hydrolyzable or reducible precursor thereof which releases a rigid fluorescent dye upon hydrolysis or reduction, respectively, of said precursor and a cationic or nonionic polymeric mordant.

3. The composition of claim 1 comprising a reducible fluorescent dye precursor of the structure $CAR—R^1)_n$ wherein CAR— is an aromatic or quinone nucleus having one or more hydrogen atoms removed to provide one or more valences through which R^1 is attached to CAR—, R^1 comprises a phenalenone or benzphenalenone moiety derived from



wherein R is hydroxy or mercapto, said moiety being attached to CAR— through an oxy or thio linkage obtained by removal of hydrogen from R, and n is 1 or 2,

provided that when R^1 is replaced with H, $CAR—(H)_n$ has an $E_{\frac{1}{2}}$ of either at least about +100 mV when measured in water.

18. A method for the determination of an analyte, said method comprising the steps of:

A. contacting a sample of a liquid suspected of containing an analyte with

a phenalenone, benzphenalenone or 4-oxo-4H-benz-[d,e]anthracene hydrolyzable or reducible fluorescent dye precursor which releases a rigid fluorescent dye upon hydrolysis or reduction, respectively, of said precursor in the presence of said analyte, and

a cationic or nonionic polymeric mordant, and

B. determining said dye released upon hydrolysis or reduction, respectively, or said precursor as a result of the presence of said analyte.

21. The method of claim 18 for the determination of a living organism.

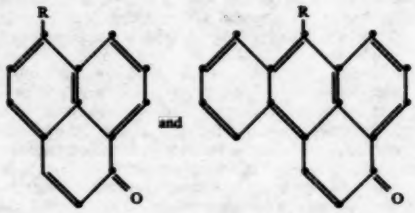
4,803,161

BIOLOGICAL AND ANALYTICAL USES OF PHENALENONE AND BENZPHENALENONE COMPOUNDS

Bruce E. Babb, Rochester; Robert T. Belly, Webster, and Albert J. Mura, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

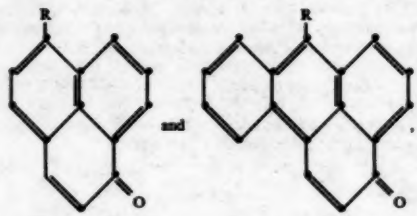
Filed Jan. 31, 1986, Ser. No. 824,757
Int. Cl.[4] C12Q 1/02
U.S. Cl. 435—29 **22 Claims**

1. An analytical test composition buffered to a pH of 9 or less, said composition comprising a fluorescent dye selected from the group consisting of



wherein R is hydroxy, mercapto or amino or salts thereof.

4. An analytical composition comprising a reducible compound of the structure $CAR—R^1)_n$ wherein CAR— is an aromatic or quinone nucleus having a hydrogen atom removed to provide a valence through which R^1 is attached to CAR—, R^1 comprises a fluorescent moiety derived from a compound selected from the group consisting of



wherein

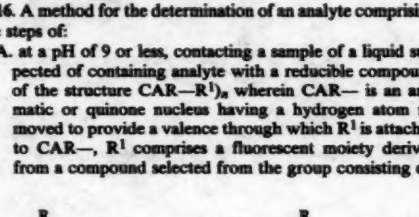
R is hydroxy or mercapto or salts thereof, and n is 1 or 2, said fluorescent moiety having an oxy or thio linkage, derived from said R group by removal of a hydrogen atom, through which said moiety is attached to said CAR— nucleus,

provided $CAR—R^1)_n$ is constructed so that it is capable of being reduced at a pH of 9 or less to release said derived fluorescent moiety, and

further provided that when R^1 is replaced with H, $CAR—H)_n$ has an $E_{\frac{1}{2}}$ of at least about +100 mV when measured in water.

16. A method for the determination of an analyte comprising the steps of:

A. at a pH of 9 or less, contacting a sample of a liquid suspected of containing analyte with a reducible compound of the structure $CAR—R^1)_n$ wherein CAR— is an aromatic or quinone nucleus having a hydrogen atom removed to provide a valence through which R^1 is attached to CAR—, R^1 comprises a fluorescent moiety derived from a compound selected from the group consisting of



wherein

R is hydroxyl or mercapto or salts thereof, and n is 1 or 2,

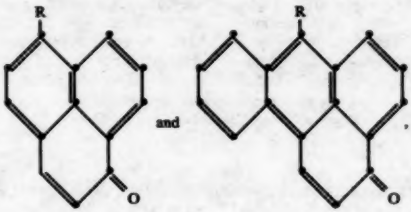
said fluorescent moiety having an oxy or thio linkage, derived from said R group by removal of a hydrogen atom, through which said moiety is attached to said CAR— nucleus,

provided CAR—$R^1)_n$ is constructed so that it is capable of being reduced at said pH to release said derived fluorescent moiety, and

further provided that when R^1 is replaced with H, CA-R—H)$_n$ has an $E_{\frac{1}{2}}$ of at least about +100 mV when measured in water, and

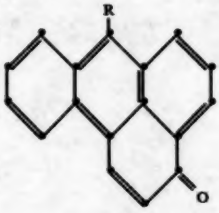
B. detecting said derived fluorescent moiety released from said compound upon its reduction as a result of the presence of said analyte.

21. A method for staining a biological specimen comprising contacting a biological specimen with a composition buffered to a pH of 9 or less, which composition comprises a fluorescent compound selected from the group consisting of



wherein R is hydroxy, mercapto or amino or salts thereof.

22. A compound of the structure



wherein R is hydroxy, mercapto or amino or salts thereof.

4,803,162

COMPOSITION, ARTICLE AND PROCESS FOR DETECTING A MICROORGANISM

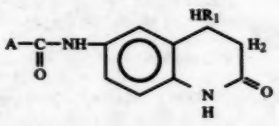
Robert E. Smith, Livermore, and Eugene N. Fox, Kensington, both of Calif., assignors to Fluorodiagnostic Limited Partners, Walnut Creek, Calif.

Filed May 15, 1984, Ser. No. 610,324

Int. Cl.[4] C12Q *1/14, 1/04, 1/36*; C07D *215/16*

U.S. Cl. 435—36 **16 Claims**

1. A compound having the structure



wherein A is an enzyme-specific substituent and R1 is a haloalkyl having fewer than five carbon atoms.

4,803,163

PREPARATION OF A PROTEIN FRACTION EXHIBITING CELL GROWTH-INHIBITING ACTIVITY

Diana Fahey, and Ernest Knight, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 617,073, Jun. 4, 1984, abandoned. This application Jul. 9, 1986, Ser. No. 883,742

Int. Cl.[4] C12P *21/00*

U.S. Cl. 435—68 **12 Claims**

1. A process for preparing a protein fraction comprising proteins which are capable of inhibiting the growth of human lymphoblastoid cells, said process comprising:

(a) growing either (1) human diploid fibroblast cells in a culture medium containing a mixture of polyinosinic and polycytidylic acids or (2) human lymphoblastoid cells selected from the group consisting of Raji, Daudi and Namalva cells in a culture medium containing either mezerein or phorbol 12-myristate 13-acetate (PMA) under conditions which induce the cells to secrete proteins into culture medium;

(b) contacting the culture medium with an immobilized triazinyl dye capable of binding human fibroblast or lymphoblastoid interferons, whereby bound and unbound protein fractions are formed; and

(c) isolating the unbound fraction which contains the growth-inhibiting proteins.

4,803,164

PREPARATION OF HEPATITIS B SURFACE ANTIGEN IN YEAST

Ronald A. Hitzeman, Pacifica; Arthur D. Levinson, Burlingame, and Daniel G. Yansura, San Francisco, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 599,387, Apr. 12, 1984, abandoned, which is a continuation of Ser. No. 298,236, Aug. 31, 1981, abandoned. This application Apr. 22, 1987, Ser. No. 42,604

Int. Cl.[4] C12P *21/00, 21/02, 21/04*; C12N *15/00*

U.S. Cl. 435—68 **11 Claims**

1. A DNA expression vector capable of replication and phenotypic selection in yeast host strain comprising a promoter compatible with a yeast host strain and a DNA sequence encoding hepatitis B surface antigen, said sequence being positioned together with translational start and stop signals in said vector under control of said promoter such that in a transformant yeast strain it is expressed to produce hepatitis B surface antigen in particle form having a sedimentation rate which is virtually identical to that of authentic 22 nm hepatitis surface antigen particles.

4,803,165

NIF PROMOTER OF FAST-GROWING RHIZOBIUM JAPONICUM

Edward R. Appelbaum, Madison, Wis., assignor to Lubrizol Genetics, Inc., Wickliffe, Ohio

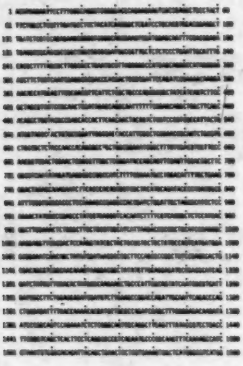
Filed Aug. 7, 1985, Ser. No. 763,800

Int. Cl.[4] C12N *15/00, 1/20*; C12P *21/00*; C07H *15/12*

U.S. Cl. 435—172.3 **21 Claims**

1. A bacterial strain containing and replicating therein a

recombinant DNA plasmid capable of functioning as a vector comprising



a composite gene comprising a promoter of a nifH gene from a fast-growing *Rhizobium japonicum* bacterium, and an extraneous structural gene under control of said promoter.

4,803,166

MICROORGANISM FOR DEGRADING TOXIC WASTE MATERIALS

Charles F. Kulpa, South Bend, Ind., and Michael G. Johnston, Durham, N.C., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jul. 3, 1986, Ser. No. 881,767
Int. Cl.[4] C12N *1/20*; C12R *1/40*; B07C *5/00*
U.S. Cl. 435—253.3 **1 Claim**

1. A biologically pure culture of *Pseudomonas putida* strain UNK-1 having all the identifying characteristics of the strain deposited under the accession number IVI-10112 wherein said culture is capable of degrading haloaromatic compounds in a liquid medium.

4,803,167

MONOCLONAL ANTIDIGOXTIN ANTIBODIES

Edgar Haber, Weston; Meredith Mudgett-Hunter, Hyde Park, and Michael Margolies, Weston, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Mar. 30, 1982, Ser. No. 363,545
Int. Cl.[4] C12N *5/00*; G01N *33/53*; C07K *15/02*
U.S. Cl. 435—240.27 **2 Claims**

1. A hybridoma capable of secreting antidigoxin antibodies which is ATCC HB-8113.

4,803,168

MICROENCAPSULATION WITH POLYMERS

Allan P. Jarvis, Jr., Newburyport, Mass., assignor to Damon Biotech, Inc., Needham Heights, Mass.

Continuation of Ser. No. 528,395, Sep. 1, 1983, abandoned. This application Jun. 4, 1986, Ser. No. 873,283
Int. Cl.[4] C12N *5/00*
U.S. Cl. 435—240.22 **6 Claims**

1. A viable cell-containing capsule comprising a semipermeable membrane defining an enclosed intracapsular volume in which viable mammalian cells are disposed within a culture medium, said membrane consisting essentially of an inner layer comprising chitosan and an outer layer comprising a polyanionic polymer, said chitosan layer and polyanionic polymer being cross-linked by ionic interaction between cationic amine groups on said chitosan and anionic groups on said polyanionic polymer to form a water-insoluble permanent capsule, said encapsulated viable cells being capable of growth and reproduction within said capsule.

4,803,169

ASSAY FOR HUMAN BREAST CANCER

Peter S. Linsley; Vincent W. Ochs; Diane Horn; Joseph P. Brown, all of Seattle, Wash.; David B. Ring, Redwood City, Calif., and Arthur E. Frankel, Chapel Hill, N.C., assignors to Cetus Corporation, Emeryville, Calif.

Filed Feb. 5, 1986, Ser. No. 826,477
Int. Cl.[4] G01N *33/577*
U.S. Cl. 435—7 **11 Claims**

1. A method of detecting breast cancer or determining the clinical stage of breast cancer in a human patient comprising:

(a) providing a sample of body fluid from said human patient; and

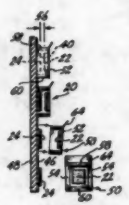
(b) determining the amount of a circulating antigen of about 260–340 kd MW by SDS-PAGE in said body fluid sample by a quantitative immunoassay using a monoclonal antibody to said circulating antigen, wherein said body fluid sample is incubated with said monoclonal antibody to determine the amount of antigen bound by said monoclonal antibody, and said selected antigen being characterized as having an epitope for an antibody produced by hybridoma cell line HB-8491 (W1) or HB-8489 (W9).

4,803,170

COMPETITIVE IMMUNOASSAY METHOD, DEVICE AND TEST KIT

Thomas H. Stanton, Seattle; James A. Clagett, Everett; Deborah C. Schindele; George E. Renzoni, both of Bothell; Niels H. Andersen, and Kent E. Opheim, both of Seattle, all of Wash., assignors to Ultra Diagnostics Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 732,445, May 9, 1985, Pat. No. 4,746,631. This application Dec. 24, 1986, Ser. No. 946,475
Int. Cl.[4] G01N *33/53*, *33/543*
U.S. Cl. 436—518 **30 Claims**



1. A device for detecting an analyte in a test fluid, comprising a reaction chamber having reagent, reaction, and detection surfaces wherein at least the detection surface does not overlap either the reagent surface or the reaction surface, the reaction chamber being adapted to receive and retain a predetermined volume of the test fluid in fluid communication with said reagent, reaction, and detection surfaces, the reagent surface having an analyte conjugate reversibly bound thereto, the analyte conjugate comprising a ligand/marker conjugated to an analyte component, the reaction surface having an analyte binding partner immobilized thereon, and the detection surface having a ligand/marker binding partner immobilized thereon.

21. A method of detecting an analyte in a test fluid, comprising the steps of:

providing a reaction chamber having reagent, reaction, and detection surfaces wherein at least the detection surface does not overlap either the reagent surface or the reaction surface, the reaction chamber being adapted to receive and retain a predetermined volume of the test fluid in fluid communication with said reagent, reaction, and detection surfaces, the reagent surface having an analyte conjugate

reversibly bound thereto, the analyte conjugate comprising a ligand/marker conjugated to an analyte component, the reaction surface having an analyte binding partner immobilized thereon, and the detection surface having a ligand/marker binding partner immobilized thereon;

introducing a volume of test fluid suspected of containing analyte into the reaction chamber in fluid communication with the reagent, reaction, and detection surfaces;

retaining the volume of test fluid in the reaction chamber to permit solubilization of analyte conjugate from the reagent surface, binding of analyte and solubilized analyte conjugate to analyte binding partner on the reaction surface, and binding of solubilized analyte conjugate to ligand/marker binding partner on the detection surface; and,

thereafter measuring the activity of sequestered ligand-/marker on the detection surface, the measured activity being a function of the analyte concentration that is referable to standards and controls.

4,803,171

REAGENT PAPER FOR IMMUNOLOGICALLY ANALYSIS, A PROCESS FOR THE PREPARATION THEREOF AND THE USE THEREOF

Manfred Baier, Seeshaupt; Klaus P. Kaspar, Asuncion; Rainer Schäfer, Seeshaupt; Ulrich Trilger, Limburgerhof, and Siegfried Nötzel, Wilhelmsfeld, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Dec. 11, 1986, Ser. No. 940,500

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1985, 3543749

Int. Cl.[4] G01N *33/52, 33/53, 33/543, 33/545*

U.S. Cl. 436—530 **36 Claims**

1. Process for the preparation of a reagent paper for immunological analysis, comprising preparing a fibre fleece of a cellulose/synthetic fibre mixture, in which the weight ratio of cellulose/synthetic fibre is from 1:99 to 90:10, wherein said fleece is activated by treating at least a portion thereof with periodate, loading said activated fibre fleece with an acid treated protein under conditions favoring binding thereto and removing non-bound protein.

4,803,172

METHOD OF MANUFACTURING THYRISTOR WITH INTEGRATED POWER SUPPLY FOR AN ASSOCIATED CIRCUIT

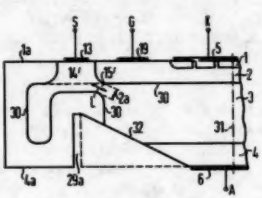
Roland Sittig, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 5,784, Jan. 22, 1987, Pat. No. 4,736,232. This application Feb. 26, 1988, Ser. No. 163,199

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1986, 3602149

Int. Cl.[4] H01L *21/223, 21/302*

U.S. Cl. 437—6 **2 Claims**



1. A method for the manufacture of a thyristor having a p-emitter, an n-base, p-base, and an n-emitter being interconnected between anode and cathode electrodes respectively, and having a shoulder of said n-base extending through said p-base to an external electrical contact, comprising the steps of performing a deep diffusion of said p-base and said p-emitter in a wafer of n-doped semiconductor material using a doping mask covering the region above said shoulder at the cathode side of said thyristor making a deep notch in the surface of said thyristor at the anode side at a location opposite said shoulder, inserting said n-emitter into said p-base, and beveling the p-n junction at the anode side of said body such that the p-doped semiconductor region adjacent the lateral faces of said notch does not constitute a conductive connection to said p-emitter.

4,803,173

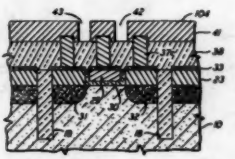
METHOD OF FABRICATION OF SEMICONDUCTOR DEVICE HAVING A PLANAR CONFIGURATION

Edward L. Sill, San Jose, and Paul G. Hilton, Boulder Creek, both of Calif., assignors to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.

Filed Jun. 29, 1987, Ser. No. 67,032

Int. Cl.[4] H01L *21/22*

U.S. Cl. 437—29 **16 Claims**



1. A method for producing an MOS device comprising source, drain and gate electrodes in a body of semiconductor, material, the top surfaces of the source, drain and gate electrodes being coplanar, the method comprising the following steps:

(a) selectively removing portions of a thick insulating layer on a single crystal semiconductor substrate to leave a mesa of insulating material on the substrate in a position corresponding to the desired gate region of the device;

(b) depositing a layer of source and drain material on the substrate and over the mesa to build up the surface of the semiconductor body and to define a gate trough therein;

(c) removing a portion of the source and drain layer in a manner to planarize the layer and to expose the insulating material filling the fate trough;

(d) removing the mesa-forming insulating material from the gate trough;

(e) forming a thin insulating layer at least on the walls and floor of the gate trough;

(f) forming the gate electrode in the gate trough;

(g) forming the source and drain electrodes; and

(h) providing electrical connection to the source, drain and gate electrodes by first forming contacts to each of these electrodes and then forming a metallization pattern thereon for external electrical connection to the source, drain and gate electrodes.

4,803,174

BIPOLAR TRANSISTOR INTEGRATED CIRCUIT AND METHOD OF MANUFACTURING THE SAME

Tadashi Hirao, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 801,789, Nov. 26, 1985, abandoned. This application Nov. 17, 1987, Ser. No. 121,912

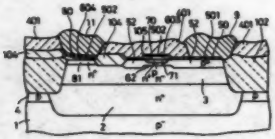
Claims priority, application Japan, Dec. 20, 1984, 59-271239

Int. Cl.[4] H01L *21/225*

U.S. Cl. 437—31 **1 Claim**

1. A method of manufacturing a bipolar transistor, which comprises the steps of:

forming a first conductivity type collector layer (3) surrounded by a isolation oxide film (102);
forming a polysilicon film (600) on said collector layer;
selectively forming a nitride film (202) on said polysilicon film;
selectively oxidizing said polysilicon firm with said nitride film thereon serving as a mask to form a first oxide film (104) while leaving a polysilicon films (601, 602) for defining emitter and collector electrodes, said polysilicon film (601) for said emitter electrode extending to an area on said isolation oxide film for defining a wiring hole;
introducing first conductivity type impurity into said remaining polysilicon films (601, 602) with said first oxide film (104) serving as a mask;
removing said first oxide film (104) from a region for defining a base layer;
injecting second conductivity type impurity into the region (5, 6) for defining said base layer by ion implantation, said conductivity type impurity being injected into the region



(6) for forming an active base layer (62) through the polysilicon film (603) for defining said emitter electrode;
diffusing said injected second conductivity type impurity to form said base layer while simultaneously diffusing said first conductivity type impurity introduced into the polysilicon films (603, 604) from the same to form an emitter layer (71) and low resistance collector contact layer (81);
oxidizing said polysilicon film (603) on said emitter layer and the surface of said base layer at a low temperature to form a second oxide film (107);
removing said second oxide film (107) while leaving a portion (105) thereof on the edge wall of said polysilicon film (603) on said emitter layer;
forming metal silicide films (502, 501) on at least said polysilicon film on said emitter layer and said base layer; and
forming a protection film on the surface of the entire region and an emitter wire, a base wire and a collector wire through contact holes provided in said protection film.

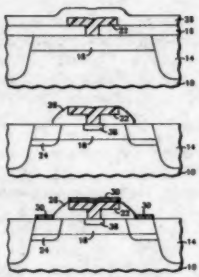
4,803,175

METHOD OF FABRICATING A BIPOLAR SEMICONDUCTOR DEVICE WITH SILICIDE CONTACTS

Antonio R. Alvarez, Sunnyvale, Calif., and James A. Kirchgessner, Mesa, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Sep. 14, 1987, Ser. No. 95,782
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—31 **14 Claims**

1. A method of processing a bipolar semiconductor device comprising the steps of:
providing a substrate;
isolating a device region on said substrate;
forming a first dielectric layer on said substrate;
forming an active base in said device region of said substrate;
defining an emitter opening in said first dielectric layer;
depositing a polysilicon layer on said first dielectric layer and in said emitter opening;
doping said polysilicon layer;
masking and etching said polysilicon layer so that said polysilicon extends beyond said emitter opening;
etching said first dielectric layer so that only the portion covered by said etched polysilicon layer remains;
forming silicide contacts on said polysilicon layer and said base;



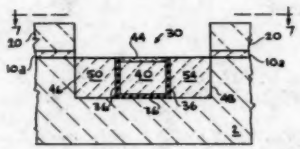
forming a second dielectric layer on said device region;
etching contact openings in said second dielectric layer, said contact openings extending to said silicide contacts; and
metallizing said contact openings to create external contacts.

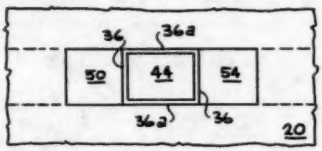
4,803,176

INTEGRATED CIRCUIT STRUCTURE WITH ACTIVE DEVICE IN MERGED SLOT AND METHOD OF MAKING SAME

Robert W. Bower, Maui, Hi., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 576,659, Feb. 3, 1984, abandoned. This application Aug. 18, 1986, Ser. No. 897,678
Int. Cl.[4] H01L *29/70, 29/78*
U.S. Cl. 437—33 **21 Claims**





1. A method for forming an improved integrated circuit structure with an active integrated circuit device formed in a single slot in the structure or substrate which comprises:
(a) forming a first portion of said slot in said substrate;
(b) constructing at least a part of one element of said active device in said slot;
(c) forming at least one additional slot portions in said substrate contiguous with said first slot portion; and
(d) constructing at least a part of at least one additional element of the same active device in said additional slot portion.

4,803,177

METHOD OF FORMING INTERCONNECTIONS AND CROSSINGS BETWEEN METALLIZATION LEVELS OF AN INTEGRATED CIRCUIT

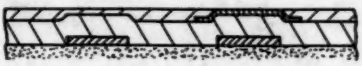
Patrick Rabinzohn, Saint Maurice, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,879

Claims priority, application France, Dec. 23, 1986, 86 18048

Int. Cl.[4] H01L *21/28*

U.S. Cl. 437—51 8 Claims



1. A method of forming interconnections and crossings between metallization levels of an integrated circuit, in which a first metallization level having a thickness e_{m1} has been formed on a substrate during an initial sequence a by means of etching or "lift-off" techniques generally used, characterized in that after the said initial sequence a resulting in that the said first metallization level is obtained, the inversion of a relief at the level of an interconnection is obtained by isotropic deposition, planarization by means of a sacrificial layer and anisotropic selective etching with respect to the said sacrificial layer according to the following further steps:

b. depositjon of a first isolating layer having a thickness e_{i1} constituting the isolation between the said metallization level and the metallization level immediately above it,

c. deposition of a second isolating layer having a thickness e_{i2} constituting a phantom mask which will permit of ensuring the isolation by the said first layer at the levels of the crossings of the metallizations,

d. etching of the isolation pattern of the said second isolating layer selectively with respect to the first layer,

e. planarization of the structure thus obtained by the use of a sacrificial layer,

f. etching of the said sacrificial layer down to the level of the second isolating layer,

g. etching of the structure thus obtained so that the respective etching rates R_1, R_2 and R_S of the said first, second and sacrificial layers, respectively, permit of merging at the first level of metallization, while at the same time the said second isolating layer having a thickness e_{i2} is partly or entirely etched on the surface of the said structure, the relief of the said first metallization level and the inversion of a relief at the areas of the interconnections resulting from a selective etching of the first isolating layer with respect to the sacrificial layer, which ensures the self-alignment of the etching of the said first isolating layer at the first metallization level without any specific photolithographic step,

h. formation of the said metallization level lying immediately above it.

4,803,178

METHOD OF MAKING SILICON-ON-SAPPHIRE GATE ARRAY

Daniel V. McCaughan, Lincoln, England, assignor to Marconi Electronic Devices Limited, England

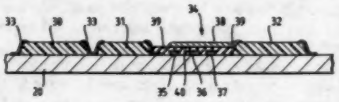
Filed Nov. 30, 1987, Ser. No. 126,562

Claims priority, application United Kingdom, Dec. 4, 1986, 8629040

Int. Cl.[4] H01L *21/225, 21/308*

U.S. Cl. 437—51 6 Claims

1. A method of making a semiconductor arrangement including the steps of forming a closely packed regular array of semiconductor island cells, each cell of which includes a semiconductor device and is formed on an insulating substrate; removing selected cells to leave a partially filled array; and forming electrically conductive interconnections for remaining cells, the interconnections at least partly overlying the sites of the removed cells.



4,803,179

METHODS FOR MAKING NEIGHBORING WELLS FOR VLS1 CMOS COMPONENTS

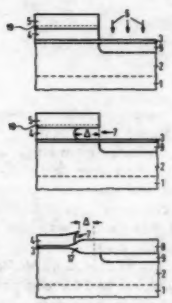
Franz Neppl, Munich, and Carlos-Alberto Mazure-Espejo, Kirchseeon, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

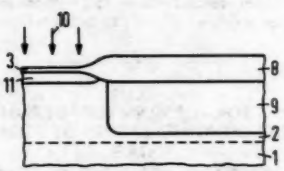
Filed Apr. 2, 1987, Ser. No. 33,261

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622504

Int. Cl.[4] H01L *21/308*

U.S. Cl. 437—70 4 Claims





1. In an improved method for the manufacture of neighboring wells implanted with dopant ions differing in conductivity type in the manufacture of VLSI complementary MOS field effect transistors (CMOS) circuits, wherein n^+-doped, or, alternatively, p^+-doped, silicon having an n^--doped, or, alternatively, p^--doped, epitaxial layer situated thereon is employed as a semiconductor substrate into which first p-wells are introduced upon employment of a composite layer consisting of a silicon oxide layer and a silicon nitride layer which composite layer is covered with a first photoresist as masking layer for n-wells, and then said n-wells are introduced upon employment of a silicon oxide layer covered with a second photoresist as masking layer for said p-wells, and whereby the edge of said composite layer is shifted in the direction of said n-wells by means of directed, lateral under-etching of said

composite layer and by means of subsequent oxidation preceding the production of said n-wells, the improvement comprising:

conducting said under-etching of said composite layer by isotropically etching into said silicon nitride mask layer under said first photoresist layer with all layers lying therebelow being not appreciably etched; and

generating an auxiliary polysilicon layer immediately above said silicon nitride mask layer and structured together with said first photoresist layer to protect said silicon nitride mask layer during said under-etching.

4,803,180

METHOD FOR MANUFACTURING PRESSURE CONTACT SEMICONDUCTOR DEVICES

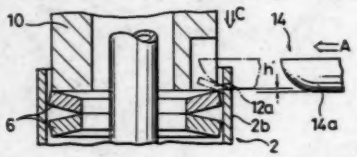
Mitsuo Ohdate, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 751,670, Jul. 3, 1985, abandoned. This application Jun. 3, 1987, Ser. No. 56,990

Claims priority, application Japan, Jul. 5, 1984, 59-102590

Int. Cl.[4] B01J *17/00*; **H01L** *23/04, 23/10, 23/48*

U.S. Cl. 437—222 **4 Claims**



1. A method for manufacturing a pressure contact semiconductor device comprising the steps of:

disposing a semiconductor element on a support member;

disposing a pan spring above said semiconductor element, said pan spring and said semiconductor element being contained in a container area of a cylindrical body;

compressing said pan spring with the lower surface of a compressing device; and

producing a plurality of folded curved projections at a top end of said cylindrical body with a pressure folding apparatus that is smoothly curved from an upper surface of said apparatus to a lower surface of said apparatus, wherein said folded curved projections are folded into said container area and into contact with the upper surface of said pan spring while said pan spring is in a compressed state.

4,803,181

PROCESS FOR FORMING SUB-MICROMETER PATTERNS USING SILYLATION OF RESIST SIDE WALLS

Peter L. Buchmann; Peter Vettiger, both of Langnau, and Bart J. Van Zeghbroeck, Richterswil, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1987, Ser. No. 26,799

Claims priority, application European Pat. Off., Mar. 27, 1986, 86104217.4

Int. Cl.[4] H01L *21/265*

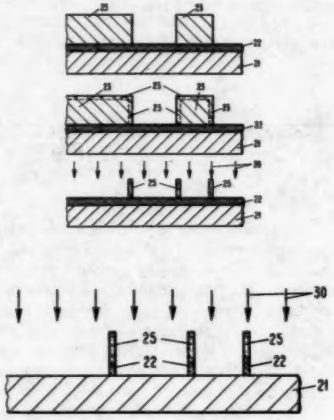
U.S. Cl. 437—228 **15 Claims**

1. A low temperature process for forming sidewalls on a substrate for use in the fabrication of structures with submicron lateral dimensions comprising the steps of:

depositing on said substrate a layer of polymeric resist comprising active hydrogen;

patterning said resist thereby forming a profile having horizontal surfaces and substantially vertical edges;

treating the maskless resist with a reactive organometallic silylation solution comprising Xylene, HMCTS and n-Methylpyrrolidone, respectively amounting to 89, 10 and 1 volume %, at a temperature of between 15° and 25° C., thereby silylating the exposed horizontal and vertical edges in said resist to a predetermined depth; and



anisotropic oxygen plasma etching said resist thereby removing the silylated resist at said horizontal surfaces and removing the unsilylated resist, leaving the silylated vertical edges.

4,803,182

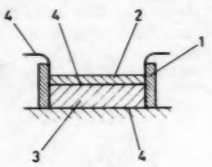
HEAT RESISTANT MATERIALS CONTAINING CERAMIC COMPONENTS

Sadanobu Ishikawa, 5-5, Omori Kita 6-chome, Ota-ku, Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,556

Int. Cl.[4] C04B *12/04, 35/18*

U.S. Cl. 501—94 **18 Claims**



1. A ceramic-based article having heat resistance, which is produced by a process comprising:

a. admixing a hardening material comprising alunite, powdery sodium silicate and sodium fluosilicate, a material for providing heat resistance comprising at least one of ceramics and metals and water,

b. shaping the resulting admixture,

c. allowing said admixture to settle,

d. drying said admixture and then

e. baking.

4,803,183

DENSE MOLDED BODIES OF POLYCRYSTALLINE ALUMINUM NITRIDE AND PROCESS FOR PREPARATION WITHOUT USE OF SINTERING AIDS

Karl-Alexander Schwetz, Sulzberg; Wolfgang Grellner, Kempten; Klaus Hunold, Lauben; Max Mohr, Kempten, and Alfred Lipp, Bad Worishofen, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 20, 1987, Ser. No. 17,776

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, 3608326

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—96 2 Claims

1. A molded body of polycrystalline aluminum nitride having a density of at least 99.8% TD calculated on the theoretical density of pure aluminum nitride comprising:

at least 99% by weight aluminum nitride,

up to 0.35% by weight residual oxygen,

up to 0.35% by weight residual carbon and

up to 0.30% by weight total of metallic impurities (Fe, Si, Ca, Mg),

wherein the aluminum nitride is present in the form of an essentially single-phase, homogeneous, isotropic microstructure with a grain size of 5 μm maximum, the residual oxygen and the residual carbon being present in the form of a solid solution in the AlN lattice and not detectable as separate phase(s) up to a 2400-times enlargement, having the following properties: bending strength (measured according to the 4-point method) at room temperature and up to about 1400° C. of at least 500 N/mm^2, predominantly transcrystalline rupture module and a heat conductivity at 300 K of at least 150 W/mK.

4,803,184

CONVERSION OF CRUDE OIL FEEDS

Gary N. Long, Putnam Valley; Regis J. Pellet, Croton-On-Hudson, and Jule A. Rabo, Armonk, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 490,952, May 2, 1983, Pat. No. 4,512,875. This application Nov. 27, 1984, Ser. No. 675,285

The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.

Int. Cl.[4] B01J *27/18*

U.S. Cl. 502—63 14 Claims

1. A catalyst effective in cracking of crude oil feeds, comprising a zeolitic aluminosilicate cracking catalyst effective in cracking of crude oil feeds selected from the group consisting of zeolite Y, LZ-210, LZ-10, Faujasite and mixtures thereof and at least one molecular sieve selected from the group consisting of the silicoaluminophosphates SAPO-5 and SAPO-11 of U.S. Pat. No. 4,440,871.

4,803,185

OCTANE BOOSTING CATALYST

James G. Miller, Pearl River; Regis J. Pellet, Croton; Edwar S. Shamshoum, Lake Peekskill, and Jule A. Rabo, Armonk, all of N.Y., assignors to UOP, Des Plaines, Ill.

Filed Jun. 4, 1987, Ser. No. 58,241

Int. Cl.[4] B01J *29/02, 29/06*

U.S. Cl. 502—65 22 Claims

20. A catalytic cracking composition comprising a combination of rare earth Y zeolite and a composite of SAPO-11 and $AlPO_4$-11.

4,803,186

SHAPE SELECTIVE CRYSTALLINE SILICATE ZEOLITE CONTAINING INTERMETALLIC COMPONENT AND USE AS CATALYST IN HYDROCARBON CONVERSIONS

Nai Y. Chen, Titusville, N.J.; Thomas F. Degnan, and Paul B. Weisz, both of Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 4, 1986, Ser. No. 938,095

Int. Cl.[4] B01J *29/10, 29/28*

U.S. Cl. 502—66 27 Claims

1. A hydrocarbon conversion catalyst for performing a variety of hydrocarbon conversion, comprising:

(a) an acidic zeolite catalyst for hydrocarbon cracking and conversion; and

(b) a hydrogenation-dehydrogenation intermetallic catalytic component contained within said zeolite,

whereby said hydrocarbon conversion catalyst is resistant to agglomeration of the intermetallic catalytic component.

16. A process for preparing a hydrocarbon conversion catalyst for performing a variety of hydrocarbon conversions, comprising:

(a) contacting a hydrogenation-dehydrogenation metal-containing acidic zeolite catalyst with a volatile inorganic metal compound or a volatile organometallic compound under anhydrous conditions in a reducing atmosphere and in an amount which is calculated to avoid significant reduction in pore volume of the zeolite; and

(b) forming a hydrogenation-dehydrogenation intermetallic catalytic compound within the zeolite from a reaction between the hydrogenation-dehydrogenation metallic catalyst contained within the zeolite and the volatile inorganic metal compound or the volatile organometallic metal compound,

whereby the resulting hydrocarbon conversion catalyst is resistant to agglomeration of the intermetallic component.

4,803,187

ALKANE OXIDATION CATALYSTS

James E. Lyons, Wallingford; Paul E. Ellis, Jr., Downingtown; Harry K. Myers, Jr., Cochranville; George Suld, Springfield, and Wayne A. Langdale, Milmont Park, all of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Jul. 20, 1987, Ser. No. 76,570

Int. Cl.[4] B01J *27/24, 27/14*

U.S. Cl. 502—200 5 Claims

1. Catalyst having the formula $H_{(e+x)}(X_kM_nO_y)^{-e}(N_3)_x$ where X is a group IIIA-VIA element, M is a transition metal, k is 1–5, n is 5–30, y is 18–62, and x is 1–4, and polyoxoanions thereof.

4,803,188

HETEROGENEOUS CATALYST CONTAINING SILICON DIOXIDE

Hubert Aulich; Hans-Peter Urbach, both of Munich, and Karl-Heinz Eisenrith, Schliersee, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,283

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1987, 3702363

Int. Cl.[4] B01J *37/00, 21/06*

U.S. Cl. 502—232 20 Claims

1. A heterogeneous catalyst based on silicon dioxide wherein the catalyst is a meso-porous material produced from large-surface glass bodies containing catalytically active additive by leaching with mineral acid, the catalytically active additives including metal oxides insoluble in hot mineral acid incorporated into an amorphous network of the glass body.

2. The catalyst of claim 1 wherein the additives are oxides of transition metals.

4,803,189

CATALYST CARRIER OF METALLIC HONEYCOMB HAVING A SUPPORTING WALL AND A METHOD FOR PRODUCING THE SAME

Helmut Swars, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Interatom GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed May 11, 1987, Ser. No. 48,574
Claims priority, application Fed. Rep. of Germany, May 12, 1986, 3615902; Aug. 11, 1986, 3627224
Int. Cl.[4] B01J *32/00, 35/04*
U.S. Cl. 502—439 54 Claims

1. Catalyst carrier body, comprising layers of textured curved metal sheets through which a fluid can flow, a jacket in which said curved metal sheets are disposed, and at least one supporting wall disposed inside and firmly joined to said jacket forming a supporting structure inside the body, at least some of said curved metal sheets being individually secured to said at least one supporting wall.

4,803,190

PROCESS FOR PRODUCTION OF COMPOSITE OXIDE CATALYSTS

Kohei Sarumaru, and Etsuji Yamamoto, both of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Mar. 24, 1987, Ser. No. 29,645
Claims priority, application Japan, Mar. 24, 1986, 61-65279
Int. Cl.[4] B01J *21/00, 23/16, 27/18*
U.S. Cl. 502—205 10 Claims

1. A process for producing a composite oxide catalyst, wherein a Mo-Bi composite oxide catalyst represented by the following formula is produced by a process in an aqueous system comprising incorporating the compounds as respective element sources into a composite and subjecting the composite to heat treatment, characterized in that bismuth oxide and/or bismuth subcarbonate substantially insoluble in said aqueous system is used as a Bi source and that heat treatment is conducted at 450° to 600° C.;

$$Mo_aBi_bCo_cNi_dFe_eNa_fX_gY_hSi_iO_j$$

wherein: X represents K, Rb, Cs and/or Tl; Y represents B, P, As and/or W; a through j represent atomic ratios, respectively, and, when a equals 12, b=2 to 7, c=0 to 10, d=0 to 10, c+d=1 to 10, e=0.05 to 3, f=0 to 0.6, g=0.04 to 0.4, h=0 to 3, i=0 to 48 and j is a numeral which satisfies the oxidation states of the other elements.

4,803,191

HEAT-SENSITIVE RECORDING PAPER

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 19, 1988, Ser. No. 157,668
Claims priority, application Japan, Feb. 19, 1987, 62-36249
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—200 16 Claims

1. A heat-sensitive recording paper comprising a paper support having thereon a heat sensitive color forming layer, wherein said paper support is made of a base paper which is 7% or less in the sum of fluctuations in uneven formation in a wavelength range of 12.5 to 80 mm as determined by means of a laser formation measuring apparatus.

4,803,192

RECORDING MATERIAL

Keiso Saeki; Masanobu Takashima, and Ken Iwakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 9, 1987, Ser. No. 71,679
Claims priority, application Japan, Jul. 9, 1986, 61-161494; Jul. 28, 1986, 61-177380
Int. Cl.[4] B41M *5/16, 5/18, 5/22*
U.S. Cl. 503—212 18 Claims

1. A recording material comprising a support having thereon the combination of at least one electron-donating colorless dye comprising a p-substituted aminophenylindolyl-phthalide moiety and at least one electron-accepting compound comprising an organic acid having at least one phenolic hydroxyl group selected from the group consisting of zinc 3,5-bis(α-methylbenzyl)salicylate and zinc 5-α-(α-methylbenzyl)-phenethylsalicylate.

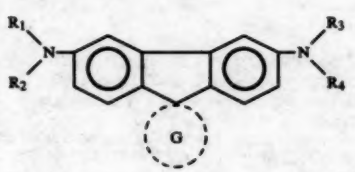
4,803,193

HEAT-SENSITIVE RECORDING MATERIAL USING CHROMENO COMPOUND

Nobuo Kanda, Hirakata; Yukihiro Abe, Nishinomiya, and Mitsuru Kondo, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

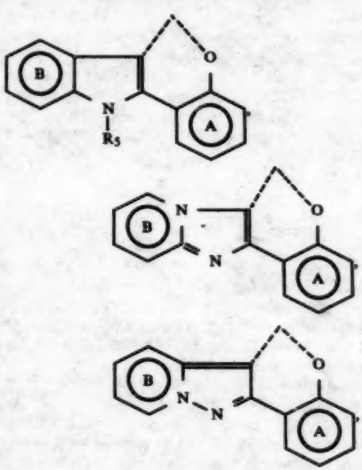
Filed Dec. 23, 1987, Ser. No. 137,368
Claims priority, application Japan, Dec. 27, 1986, 61-314744
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—209 10 Claims

1. In a heat-sensitive recording material comprising on a substrate a recording layer containing a colorless or pale-colored basic dye and an electron accepting reactant material, the heat-sensitive recording material which is characterized in that the basic dye comprises at least one chromeno compound represented by the formula [I] below



(I)

wherein G represents the following:



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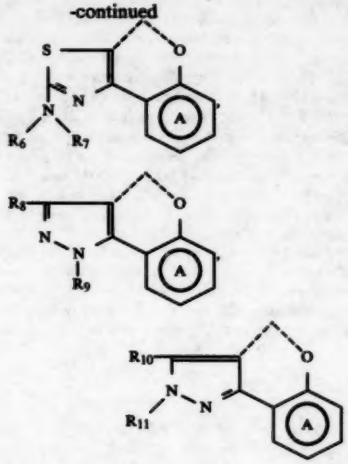


R_1, R_2, R_3 and R_4 are each hydrogen atom; $C_{1\sim12}$ alkyl unsubstituted or substituted with halogen atom or $C_{1\sim4}$ alkoxyl; $C_{3\sim12}$ alkenyl unsubstituted or substituted with phenyl; $C_{3\sim12}$ alkynyl unsubstituted or substituted with phenyl; $C_{5\sim12}$ cycloalkyl unsubstituted or substituted with $C_{1\sim4}$ alkyl; phenyl-$C_{1\sim2}$ alkyl unsubstituted or substituted with halogen atom, nitro, $C_{1\sim4}$ alkyl or $C_{1\sim4}$ alkoxyl; phenyl unsubstituted or substituted with halogen atom, nitro, $C_{1\sim4}$ alkyl, $C_{1\sim4}$ alkoxyl or $C_{1\sim4}$ halogenated alkyl; naphthyl unsubstituted or substituted with halogen atom; nitro, $C_{1\sim4}$ alkyl, $C_{1\sim4}$ alkoxyl or $C_{1\sim4}$ halogenated alkyl; R_1 and R_2, and R_3 and R_4 may form together therewith or with an adjacent benzene ring a heteroring selected from the group consisting of pyrrolidine ring, piperidine ring, morpholine ring, hexamethyleneimine ring, tetrahydroquinoline ring and julolidine ring; R_5, R_6, R_7, R_8, R_9, R_{10} and R_{11} are each hydrogen atom; $C_{1\sim12}$ alkyl unsubstituted or substituted with halogen atom or $C_{1\sim4}$ alkoxyl; $C_{3\sim12}$ alkenyl unsubstituted or substituted with phenyl; $C_{3\sim12}$ alkynyl unsubstituted or substituted with phenyl; benzyl unsubstituted or substituted with halogen atom, nitro, $C_{1\sim4}$ alkyl or $C_{1\sim4}$ alkoxyl; phenyl unsubstituted or substituted with halogen atom, nitro, $C_{1\sim4}$ alkyl, $C_{1\sim4}$ alkoxyl or $C_{1\sim4}$ halogenated alkyl; naphthyl unsubstituted or substituted with halogen atom, nitro, $C_{1\sim4}$ alkyl, $C_{1\sim4}$ alkoxyl or $C_{1\sim4}$ halogenated alkyl; R_6 and R_7 may form a pyrrolidine ring together therewith, each of the benzene ring A and benzene ring B may be substituted by halogen atom; $C_{1\sim4}$ alkyl; $C_{1\sim4}$ alkoxyl; benzyl unsubstituted or substituted with halogen atom, nitro, $C_{1\sim4}$ alkyl or $C_{1\sim4}$ alkoxyl; phenyl unsubstituted or substituted with halogen atom, nitro, $C_{1\sim4}$ alkyl or $C_{1\sim4}$ alkoxyl; amino unsubstituted or substituted with $C_{1\sim4}$ alkyl.

4,803,194

THERMAL TRANSFER PRINTING PAPER

Robert G. Bracewell, Canterbury, United Kingdom, assignor to The Wiggins Teape Group Limited, Basingstoke, England

Filed Sep. 19, 1986, Ser. No. 909,267

Claims priority, application United Kingdom, Sep. 19, 1985, 8523179

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **7 Claims**

1. A thermal system including a dye donor ribbon and a thermal transfer printing paper comprising a substrate having a receiving layer for receiving imaging material thermally transferred from the donor ribbon, said receiving layer consisting essentially of a dried polyethylene emulsion, said polyethylene being the only synthetic resin in said receiving layer.

4,803,195

PERFUME COMPOSITION WITH DEODORISING OR ANTIPERSPIRANT ACTION

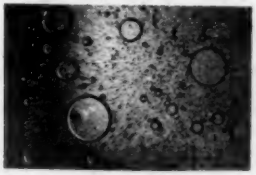
Günter Holzner, Grand-Lancy, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Filed Feb. 17, 1988, Ser. No. 157,422

Claims priority, application Switzerland, Feb. 20, 1987, 647/87

Int. Cl.[4] A61K *7/46*

U.S. Cl. 512—4 **6 Claims**



1. A perfuming composition with deodorant or antiperspirant action for use in personal care, characterised in that it contains, in addition to an active deodorant or antiperspirant base, a perfuming base, either in the form of an aqueous emulsion, or in microencapsulated form, the said perfuming base being combined with

a. a solid film-forming substrate chosen from polyvinyl acetate, polyvinyl alcohol, dextrins, natural or modified starch, vegetable gums, pectins, xanthans, carboxymethylcellulose, methylcellulose, hydroxymethylcellulose and lipoheteropholysaccharides, and

b. an emulsifying agent chosen from mono- or diglycerides of fatty acids, esters derived from the combination of fatty acids with sorbitol or a saccharide, or their alkoxylated derivatives, or an ester of tartaric, citric, ascorbic or lactic acid.

4,803,196

PHARMACEUTICAL COMPOSITIONS CONTAINING β-LACTAM ANTIBIOTICS

Betty L. Richardson, Harrow, England, assignor to Glaxo Group Limited, London, England

Continuation of Ser. No. 816,826, Jan. 7, 1986, abandoned, which is a continuation of Ser. No. 530,655, Nov. 9, 1983, Pat. No. 4,582,830. This application Jun. 4, 1987, Ser. No. 58,119

Claims priority, application United Kingdom, Sep. 10, 1982, 8225853

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/43, 31/545*

U.S. Cl. 514—198 **11 Claims**

1. A solid pharmaceutical compositon comprising one or more β-lactam antibiotics in acidic or amphoteric form in association with at least one physiologically acceptable base in the presence of a gaseous atmosphere containing a stabilising amount of carbon dioxide at a concentration greater than that of atmospheric air.

4,803,197

2,1-BENZOTHIAZEPINE-2,2-DIOXIDE-5-CARBOXYLIC ACID DERIVATIVES

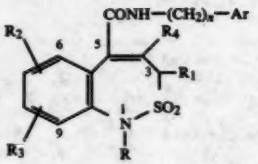
Jan W. F. Wasley, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 12, 1987, Ser. No. 2,074

Int. Cl.[4] C07D *281/02*; A61K *31/55*

U.S. Cl. 514—211 **13 Claims**

1. A compound of the formula



or a tautomer thereof wherein n prepresents zero; Ar represents phenyl or phenyl monosubstituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylmercapto, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl, halogen or trifluoromethyl, or phenyl disubstituted by radicals selected from C_1–C_4-alkyl, C_1–C_4-alkoxy and halogen; R represents hydrogen, C_1–C_4-alkyl, phenyl-C_1–C_4-alkyl or phenyl-C_1–C_4-alkyl monosubstituted on phenyl by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylmercapto, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl, halogen or trifluoromethyl, or phenyl-C_1–C_4-alkyl disubstituted on phenyl by radicals selected from C_1–C_4-alkyl, C_1–C_4-alkoxy and halogen; R_1 represents hydrogen, C_1–C_4-alkyl, phenyl-C_1–C_4-alkyl or phenyl-C_1–C_4-alkyl monosubstituted on phenyl by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylmercapto, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl, halogen or trifluoromethyl, or phenyl-C_1–C_4-alkyl disubstituted on phenyl by radicals selected from C_1–C_4-alkyl, C_1–C_4-alkoxy and halogen; R_2 represents hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen or trifluoromethyl; R_3 represents hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen; R_4 represents hydroxy; or a pharmaceutically acceptable salt thereof,

6. A pharmaceutical composition suitable for inhibiting the chemotactic activation of neutrophils in mammals which comprises an effective neutrophil chemotactic activation inhibiting amount of a compound of claim 1 or of a said compound in combination with one or more pharmaceutically acceptable carriers.

4,803,198

1-PHENYL-2-AMINOCARBONYLINDOLE COMPOUNDS, PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Heinrich-Wilhelm Ohlendorf; Wilhelm Kaupmann, both of Hanover; Ulrich Kuehl, Gehrden; Gerd Buschmann, and Stephen J. Magda, both of Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

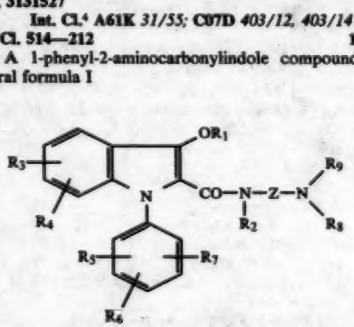
Continuation of Ser. No. 648,932, Sep. 15, 1984, abandoned, which is a continuation of Ser. No. 402,766, Jul. 28, 1982, abandoned. This application Jul. 15, 1986, Ser. No. 885,684

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131527

Int. Cl.[4] A61K *31/55*; C07D *403/12, 403/14*

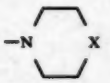
U.S. Cl. 514—212 10 Claims

1. A 1-phenyl-2-aminocarbonylindole compound of the general formula I



I

wherein R_1 is a hydrogen atom or an alkyl, alkenyl, cycloalkyl or cycloalkylalkyl radical with up to 7 carbon atoms, R_2 is a hydrogen atom or lower alkyl radical, R_3 is a hydrogen or halogen atom, or a lower alkyl, hydroxyl or lower alkoxy radical, R_4 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy, hydroxyl radical or, if R_3 is a hydrogen atom, R_4 may be a nitro or trifluoromethyl radical, or R_3 and R_4 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy radical, R_5 is a hydrogen or halogen atom, or a lower alkyl, hydroxyl or lower alkoxy radical, R_6 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy or hydroxyl radical or, if R_5 is a hydrogen atom, R_6 may be a nitro or trifluoromethyl radical, or R_5 and R_6 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy radical, R_7 is a hydrogen atom or, if R_5 and R_6 are lower alkoxy radicals, R_7 may also be a lower alkoxy radical, R_8 is a hydrogen atom or lower alkyl radical and R_9 is a hydrogen atom or lower alkyl radical, or R_8 and R_9, together with the nitrogen atom to which they are bonded, from a heterocyclic group corresponding to the formula:



where X represents a bond, an oxygen or sulphur atom, or a $—CH_2—$ or $—C_2H_4—$, radical and Z is an alkylene chain which has 2 to 5 carbon atoms and which is unsubstituted or substituted by hydroxyl on a carbon atom which is not bonded to nitrogen; or a pharmacologically acceptable acid addition salt of said compound.

10. A pharmaceutical composition containing an effective heart rhythm regulating amount of a 1-phenyl-2-aminocarbonylindole compound as claimed in claim 1 and a solid or liquid pharmaceutical carrier or excipient.

4,803,199

PHARMACEUTICALLY USEFUL HETEROCYCLIC AND CARBOCYCLIC ACID ESTERS AND AMIDES OF ALKYLENE BRIDGED PIPERIDINES

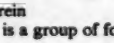
Peter Donatsch, 34 Herrenweg, CH-4123 Allschwil, Switzerland; Günter Engel, 11 Im Hasengarten, D-7858 Weil, Fed. Rep. of Germany; Bruno Hügi, 86A Hautpstrasse, CH-4148 Pfeffingen, Switzerland; Brian P. Richardson, 8 Im Hofacker, CH-4312 Magden, Switzerland; Paul A. Stadler, deceased, late of Biel-Benken, Switzerland; by Hildegard R. Stadler, heir, Jakobsweg 9, CH-4105 Biel-Benken; by Brigitte M. Stadler, heir, Jakobsweg 9, CH-4105 Biel-Benken, Switzerland; by Sigrid A. Stadler, heir, Jakobsweg 9, CH-4105 Biel-Benken, Switzerland, and by Gerald Breuleux, legal representative, Im Glockenacker 53, CH-8053 Witikov, Zürich, all of Switzerland

Continuation of Ser. No. 896,552, Aug. 14, 1986, abandoned, which is a continuation of Ser. No. 637,952, Aug. 6, 1984, abandoned, which is a continuation of Ser. No. 508,902, Jun. 28, 1983, abandoned. This application Nov. 25, 1987, Ser. No. 125,048

Int. Cl.[4] A61K *31/46*; C07D *451/12*

U.S. Cl. 514—214 24 Claims

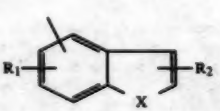
1. A compound in free base form of formula I:



I

wherein

A is a group of formula II



II

wherein the free valence is attached to the fused benzene ring;

X is $-CH_2-$, $-NR_3-$, $-O-$ or $-S-$;

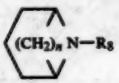
R_1 and R_2, independently, are hydrogen, halogen, (C_{1-4})alkyl, (C_{1-4})alkoxy, hydroxy, amino, (C_{1-4})alkylamino, di-(C_{1-4})alkylamino, mercapto or (C_{1-4})alkylthio; and

R_3 is hydrogen, (C_{1-4})alkyl, (C_{3-5})alkenyl, unsubstituted phenyl, phenyl monosubstituted by (C_{1-4})alkyl, halogen, hydroxy or (C_{1-4})alkoxy, or unsubstituted phenyl (C_{1-4})alkyl;

B is —O— or —NH—; and

D is a group of formula IV

IV

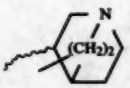


wherein

n is 2, 3, or 4, and

R_8 is hydrogen, (C_{1-7})alkyl, (C_{3-5})alkenyl or unsubstituted phenyl (C_{1-4})alkyl; or D is a group of formula V

V



or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

4,803,200

SUBSTITUTED DIALKANOLAMINES, SULFUR ANALOGS AND CONDENSED 1,4-OXAZINE DERIVATIVES THEREOF IN VIRAL DISEASE TREATMENT

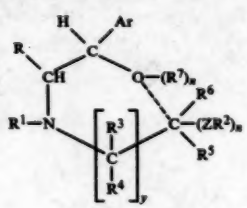
Harry R. Munson, Jr., and Robert W. Tankersley, Jr., both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Oct. 2, 1987, Ser. No. 103,938

Int. Cl.[4] C07C *121/78*

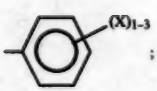
U.S. Cl. 514—231.2 **36 Claims**

1. A method of combating viral infections due to bovine parainfluenza-3 virus (shipping fever virus) in animals which comprises administering to said animals a compound selected from the group having the formula in an amount effective to control shipping fever virus:



wherein;

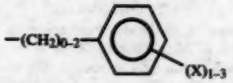
Ar is



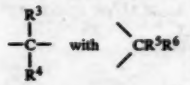
;

Z is oxygen or sulfur;

R is selected from hydrogen, loweralkyl, or



R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are selected from hydrogen or loweralkyl;



together may form a lowercycloalkyl group (3–9 carbons); or R^5 with ZR^2 when taken together may form a 5-membered saturated oxygen or sulfur containing heterocyclic ring;

X is selected from hydrogen, halo, loweralkoxy, loweralkyl, trifluoromethyl or dimethylamino, and when X is more than 1, it may be the same radical or different;

y is 0, 1 or 2;

n is 1 or zero and when n is 1, the stereoisomers thereof, and when n is zero the dotted line becomes an oxygen-carbon bond forming a ring, and the pharmaceutically acceptable acid addition salts of all thereof.

4,803,201

HOMOCYCLIC DERIVATIVES

Arnold H. Ratcliffe, Poynton, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 895,582, Aug. 13, 1986, abandoned, which is a continuation of Ser. No. 515,529, Jul. 20, 1983, abandoned. This application May 28, 1987, Ser. No. 54,897

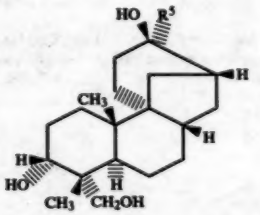
Claims priority, application United Kingdom, Nov. 10, 1982, 8232084

Int. Cl.[4] C07C *101/02*

U.S. Cl. 514—239.2 **9 Claims**

1. A compound of the formula:

II



wherein R^5 stands for a glycyloxymethyl, γ-(N-morpholino)-n-butyryloxymethyl, m-carboxybenzenesulphonyloxymethyl or 5-dimethyl-aminonaphthalenesulphonyloxymethyl radical or a pharmaceutically acceptable salt thereof.

4,803,202

SUBSTITUTED N-METHYL DERIVATIVES OF MITINDOMIDE

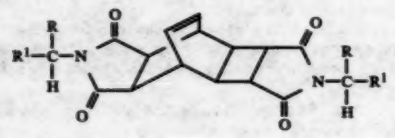
Rudiger D. Haugwitz, Bethesda; Venkatachala Narstanan, Gaithersburg, both of Md.; Leon H. Zalkow, Atlanta, Ga.; Howard M. Deutsch, Atlanta, Ga., and Leslie Gelbaum, Atlanta, Ga., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 604,136, Apr. 26, 1984, Pat. No. 4,670,461. This application Mar. 12, 1987, Ser. No. 25,062

Int. Cl.[4] A61K *31/38, 31/40;* **C07D** *209/56*

U.S. Cl. 514—228.2 **5 Claims**

1. A compound of the formula:

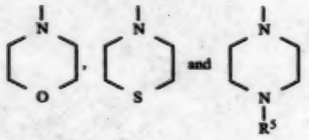


wherein

R=hydrogen, lower alkyl, phenyl, benzyl, or carboxylic acid group;

wherein

each R^1 is the same and are selected from the group consisting of:



wherein

R^5=alkyl or benzyl; and physiologically acceptable acid-addition salts thereof.

5. A method of treating mammals implanted with L1210 leukemia comprising administering to said mammals an antineoplastically effective amount of the compound of claim 1.

4,803,203

PHENYL AND HETEROCYCLIC PIPERAZINYL ALKOXY-BENZHETEROCYCLIC COMPOUNDS AS ANTIPSYCHOTIC AGENTS

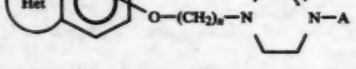
Bradley W. Caprathe, Redford; Horace A. DeWald, Ann Arbor; Juan C. Jaen, Plymouth, and Lawrence D. Wise, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 924,627, Nov. 5, 1986, Pat. No. 4,704,390, which is a continuation-in-part of Ser. No. 829,036, Feb. 13, 1986, abandoned. This application Jun. 16, 1987, Ser. No. 62,752

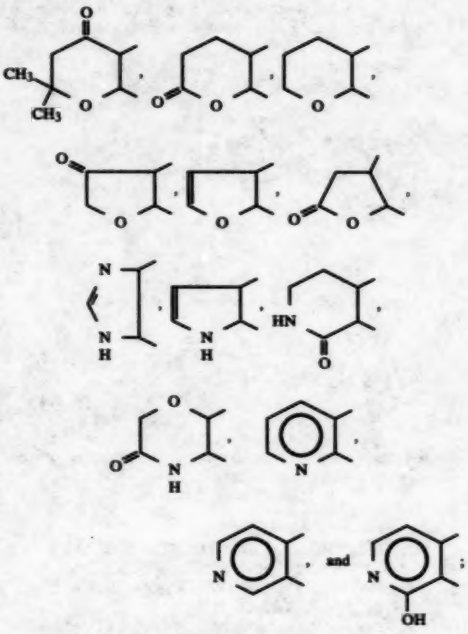
Int. Cl.[4] A61K *31/495, 31/535;* **C07D** *405/12, 413/14*

U.S. Cl. 514—230.5 **22 Claims**

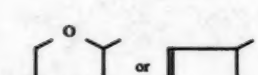
1. A compound of the formula



in which Het is selected from the group consisting of



n is an integer from two to five; A is phenyl or phenyl substituted by loer alkyl, lower alkoxy, lower thioalkoxy, halogen or trifluoromethyl; 2-, 3- or 4-pyridinyl or 2-, 3- or 4-pyridinyl substituted by lower alkyl, lower alkoxy or halogen; 2-, 4- or 5-pyrimidinyl, or 2-, 4- or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy or halogen; 2-pyrazinyl or 2-pyrazinyl substituted by lower alkyl, lower alkoxy or halogen; 2- or 3-thienyl or 2- or 3-thienyl substituted by lower alkyl or halogen; 2- or 3-furanyl or 2- or 3-furanyl substituted by lower alkyl or halogen, or 2- or 5-thiazolyl or 2- or 5-thiazolyl substituted by lower alkyl or halogen, or a pharmaceutically acceptable acid addition salt thereof, with the exclusion of the compound wherein Het is



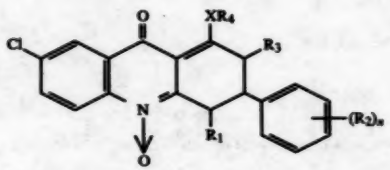
and A is phenyl or substituted phenyl.

4,803,204
1-SUBSTITUTED 3-ARYL-7-CHLORO-3,4-DIHYDRO(2H)-ACRIDONE N-OXIDES, A PROCESS FOR THEIR PREPARATION, AND THEIR USE AS MEDICAMENTS AND FEEDSTUFF ADDITIVES

Rajkumar Dhar; Bindumadhavan Venugopalan; Dipak K. Chatterjee; Richard H. Rupp, and Noel J. de Souza, all of Bombay, India, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 20, 1987, Ser. No. 75,643
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1986, 3624702
Int. Cl.[4] A61K *31/47*; C07D *219/06, 219/08*
U.S. Cl. 514—232.8 7 Claims

1. A compound of the formula I



I

in which

R_1 and R_3, which are identical or different, are hydrogen, C_1–C_4-alkyl, C_2–C_5-carbalkoxy, phenyl, or phenyl which is monosubstituted or polysubstituted by C_1–C_4-alkyl, halogen or amino,

R_2 is halogen or trifluoromethyl, wherein the substituents are identical or different if n is the integer 2 or 3,

n is an integer from 0 to 3,

X is oxygen or nitrogen,

R_4, if X is oxygen, is C_1–C_4-alkyl or, if X is nitrogen,

XR_4 is di-C_1–C_4-alkylamino, a 5- or 6-membered nitrogen heterocyclic ring or a 5- or 6-membered nitrogen heterocyclic ring which contains a further nitrogen or oxygen atom and is unsubstituted or monosubstituted or polysubstituted by C_1–C_4-alkyl, by substituted C_1–C_4-alkyl, by phenyl or by phenyl which is itself monosubstituted or polysubstituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen.

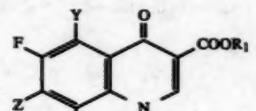
5. A method for treating protozoa infections in a mammal which comprises administering an effective amount of a compound as claimed in claim 1.

4,803,205
QUINOLONES AS ANTIBACTERIAL AGENTS

Alexander J. Bridges, Ann Arbor, and John M. Domagala, Canton, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 83,532, Aug. 7, 1987, Pat. No. 4,780,468.
This application Jun. 7, 1988, Ser. No. 203,399
Int. Cl.[4] A61K *31/495*; C07D *401/04*
U.S. Cl. 514—254 11 Claims

1. A compound of the formula



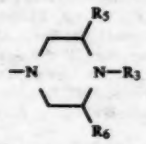
I

wherein R_1 is hydrogen, an alkyl of from one to six carbon atoms or a cation;

R_2 is alkyl of from one to four carbon atoms, vinyl, haloalkyl or hydroxyalkyl of from one to four carbon atoms or cycloalkyl of from three to six carbon atoms,

Y is hydrogen, fluoro, or amino;

Z is



R_3 is hydrogen, alkyl of from one to four carbon atoms or a cycloalkyl of from three to six carbon atoms;

R_5 and R_6 are each independently hydrogen or alkyl of from one to three carbon atoms;

or a pharmaceutically acceptable acid addition or base salt thereof.

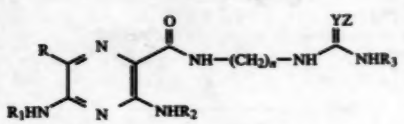
11. A method of treating bacterial infections in mammals which comprises administering to said mammal a pharmaceutical composition as claimed in claim 10 in unit dosage form.

4,803,206
ANTIHYPERTENSIVE ACYLPYRAZINES

Charles V. Magatti, Verona, and Ronald J. Doll, Maplewood, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Mar. 7, 1988, Ser. No. 164,594
Int. Cl.[4] A61K *31/495*; C07D *241/20*
U.S. Cl. 514—255 14 Claims

1. A compound represented by the formula



wherein

n is 2–6;

R is F, Cl, Br or I;

R_1 and R_2 are independently hydrogen or lower alkyl;

R_3 is hydrogen, lower alkyl, aryl, substituted aryl, heteroraryl, substituted heteroaryl, lower alkylaryl, substituted lower alkylaryl, lower alkylheteroaryl, or substituted lower alkylheteroaryl wherein aryl is a C_6–C_{10} carbocyclic aromatic single or fused ring, heteroaryl is a 5–6 membered aromatic ring wherein 1–3 ring members are selected from the group consisting of oxygen, nitrogen and sulfur, and wherein substituted aryl, substituted heteroaryl, substituted lower alkylaryl and substituted lower alkylheteroaryl have on the aryl or heteroaryl portions thereof 1–3 substitutents selected from the group consisting of lower alkyl, lower alkoxy, halogeno, amino, carboxy and lower alkoxy carbonyl;

Y is =CH— or =N—;

Z is hydrogen, cyano or carbamoyl when Y is =N—, and when Y is =CH—, Z is nitro;

and the pharmaceutically acceptable acid addition salts thereof.

13. A method of treating hypertension comprising administering an antihypertensive effective amount of a compound of claim 1 to a mammal in need of such treatment.

4,803,207

HYPOGLYCEMIC 2',3',10'-TETRAHYDRO-10'-HYDROXY-10'-SUBSTITUTED-SPIRO[CYCLOAKANE-1,3'-PYRIMIDO(1,2-A)INDOLE]DERATIVES

Alan C. White, Englefield Green; Ian A. Cliffe, Cippenham, and Richard S. Todd, Burnham, all of England, assignors to John Wyeth & Brother Ltd., Maidenhead, England

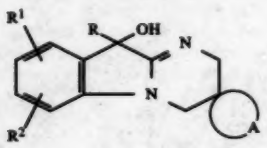
Filed Mar. 9, 1987, Ser. No. 23,333

Claims priority, application United Kingdom, Mar. 13, 1986, 8606254

Int. Cl.[4] **C07D** *487/04;* **A61K** *31/505*

U.S. Cl. 514—267 **10 Claims**

10. A method for treating diabetics which comprises administering to a mammal in need thereof, a hypoglycemically effective amount of a compound of formula:



in which

R is alkyl of 1 to 6 carbon atoms, or substituted or unsubsti naphthyl, furyl, thienyl, pyridyl, indolyl or benzothienyl, in which the substituents are hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of I to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

R^1 and R^2 are, independently, hydrogen, hydroxyl, alkyl of 1 to 6 carbon alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

and

A, together with the carbon atom to which it is attached, completes a cyclopentane, cyclohexane or cycloheptane ring;

or a pharmaceutically acceptable salt thereof.

4,803,208

OPIATE AGONISTS AND ANTAGONISTS

Gavril W. Pasternak, New York, N.Y., assignor to Sloan-Kettering Institute For Cancer Research, New York, N.Y.

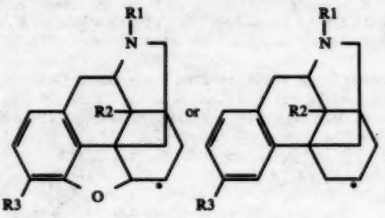
Continuation of Ser. No. 430,630, Sep. 30, 1982, Pat. No. 4,608,376, which is a continuation-in-part of Ser. No. 312,018, Oct. 16, 1981, abandoned. This application Oct. 11, 1985, Ser. No. 786,879

The portion of the term of this patent subsequent to Aug. 26, 2003, has been disclaimed.

Int. Cl.[4] **C07D** *489/08, 471/08;* **A61K** *31/485*

U.S. Cl. 514—282 **25 Claims**

1. Dihydromorphinone compound of the general formula HDM=N—R wherein HDM is

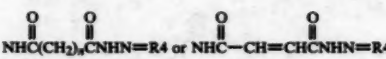


wherein • indicates binding carbon, R1 is C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_3–C_6 cycloalkyl, or cyclopropylmethyl,

R2 is OH or H,

R3 is OH,

R is N=R4, NH—R5,

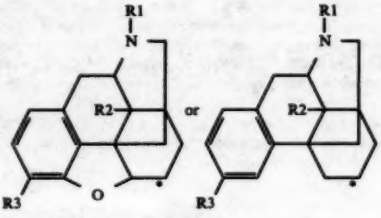


R4 is C_2–C_{10} alkenylidine, or HDM,

R5 is phenyl, C_1–C_6 alkyl, C_2–C_{10} alkenyl, C_3–C_{10} cycloalkyl, and

n is 1–10.

9. Method of controlling appetite comprising selectively and/or irreversibly blocking the mu1 opiate receptors by administering to a mammal an effective amount of a dihydromorphinone compound of the formula HDM=N—R wherein HDM is

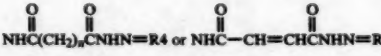


wherein • indicates binding carbon, R1 is C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_3–C_6 cycloalkyl, or cyclopropylmethyl,

R2 is OH or H,

R3 is OH or OCH_3,

R is N=N=R4, NH—R5



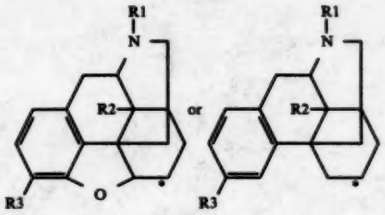
R4 is C_2–C_{10} alkenylidine, or HDM,

R5 is phenyl, C_1–C_6 alkyl, C_2–C_{10} alkenyl, C_3–C_{10} cycloalkyl, and

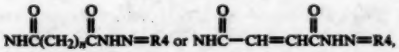
n is 1–10.

10. Method of modulating prolactin hormone release comprising administering an effective amount of the compound of claim 1 to a mammal.

19. Method of reducing pain comprising administering to a mammal an analgesically effective amount of a dihydromorphinone compound of the general formula HDM=N—R wherein HDM is



wherein * indicates binding carbon, R1 is C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_3–C_6 cycloalkyl, or cyclopropylmethyl,
R2 is OH or H,
R3 is OH or OCH_3,
R is N=R4, NH—R5

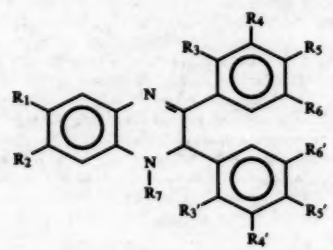


R4 is C_2–C_{10} alkenylidine, or HDM,
R5 is phenyl, C_1–C_6 alkyl, C_2–C_{10} alkenyl, C_3–C_{10} cycloalkyl, and
n is 1–10.

20. Method of reducing opiate dependency in an addict comprising administering an effective amount of the compound of claim 1.

4,803,209
SUBSTITUTED 2,3-DIPHENYL-1,2-DIHYDROQUINOXALINES
Kurt G. R. Sundelin, Wilmington, Del.; Joseph P. Salanitro, Houston, Tex., and Susan Stackhouse, Hughson, Calif., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.
Filed Aug. 27, 1987, Ser. No. 90,342
Int. Cl.[4] C07D *241/40*; A61K *31/495, 31/65, 31/71*
U.S. Cl. 514—249 **24 Claims**

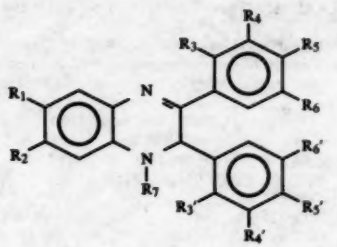
1. A compound of the formula



(I)

wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy; R_3 and R_3' are independently selected from the group consisting of halogen, hydroxy, lower alkoxy, lower acyloxy and lower alkylcarbonyloxy, R_4, R_4', R_5, R_5', R_6 and R_6'0 are independently selected from the group consisting of hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy and lower acyloxy; and R_7 is hydrogen or lower acyl; or a pharmaceutically acceptable salt thereof.

17. A process for controlling coccidiosis in poultry which comprises administering to such poultry a coccidiosis-controlling amount of a compound of the formula

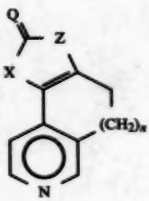


(I)

wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy; R_3 and R_3' are independently selected from the group consisting of halogen, hydroxy, lower alkoxy, lower acyloxy and lower alkylcarbonyloxy, R_4, R_4', R_5, R_5', R_6 and R_6' are independently selected from the group consisting of hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy and lower acyloxy; and R_7 is hydrogen or lower acyl; or a pharmaceutically acceptable salt thereof.

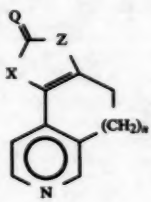
4,803,210
CARDIOTONIC TRICYCLIC OXAZOLONES
Winton D. Jones; Richard A. Schnettler; George P. Claxton, and Richard C. Dage, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio
Continuation of Ser. No. 55,485, May 29, 1987, abandoned. This application Apr. 14, 1988, Ser. No. 183,537
Int. Cl.[4] A61K *31/42*; C07D *498/04*
U.S. Cl. 514—293 **16 Claims**

1. A compound of the structure:



wherein Q is a divalent sulfur or oxygen atom; one of X and Z is an oxygen atom and the other is an imino (NH) group; and n is 0 or the integer 1 or 2 or a pharmaceutically acceptably salt thereof.

6. A method of treating heart failure in a patient in need thereof which comprises administering to the patient a cardiotonically effective amount of a compound of the structure:



wherein
Q is a divalent sulfur or oxygen atom; one of X and Z is an oxygen atom and the other is an imino (NH) group; and n is 0 or the integer 1 or 2 or a pharmaceutically acceptably salt thereof.

4,803,211

THIADIZAZOLE COMPOUNDS AS ANTAGONISTS OF SRS-A

Toshiyasu Mase, Chiba; Ryuji Tsuzuki, Tokyo; Hiromu Hara, Saitama; Kiyoshi Murase, Saitama, and Kenichi Tomioka, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

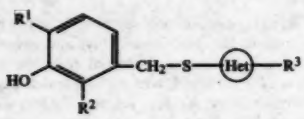
Filed Jul. 14, 1986, Ser. No. 885,085

Claims priority, application Japan, Jul. 22, 1985, 60-164267; Oct. 7, 1985, 60-224197; Dec. 26, 1985, 60-297097

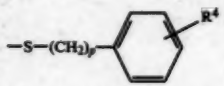
Int. Cl.[4] C07D *285/12*; A61K *31/41*

U.S. Cl. 514—361 **7 Claims**

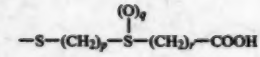
1. A thiadiazole compound represented by formula:



wherein R^1 represents a C_1-C_6 alkanoyl group; R^2 represents a lower alkyl group; Het represents a thiadiazole ring wherein one carbon atom in the ring binds to R^3 and the other binds to the ajacent thio group; R^3 represents a carboxy group, an amino group, a lower alkylamino group, a carboxy lower alkylamino group, a lower alkanoylamino group, a carboxy lower alkanoylamino group, a di-lower alkylamino group, a hydroxy group, a lower alkoxy group, a carboxy lower alkoxy group, a mercapto group, a lower alkylthio group, or a carboxy lower alkylthio group, a group represented by the formula:



or formula:



(wherein p represents an integer of 1 to 5; q represents 0, 1 or 2, r represents an integer of 1 to 5; R^4 represents a carboxy group, a lower alkoxy group, a carboxy lower alkoxy group, a lower alkyl group, a carboxy lower alkyl group and each except the carboxy group may have a sulfur atom or an oxygen atom between two carbon atoms in the carbon chain thereof); provided that when the compound is substituted by a carboxy group, said carboxy group may be in the form of a lower alkyl ester, a phenyl lower alkyl ester, or a lower alkoxy phenyl lower alkyl ester; or a pharmacologically acceptable non-toxic acid addition salt thereof.

4,803,212

AMINO DISULFIDES

Dolatrai M. Vyas, Fayetteville, N.Y.; Yulin Chiang, Morristown, N.J., and Terrence W. Doyle, Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

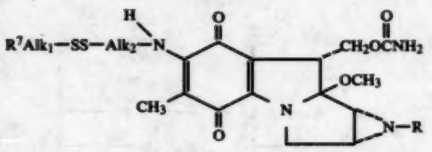
Continuation-in-part of Ser. No. 484,016, Apr. 11, 1983, abandoned. This application Feb. 24, 1984, Ser. No. 581,291

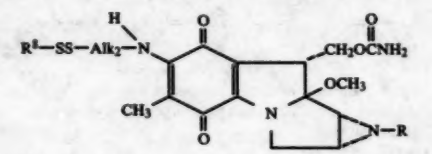
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/44*, *31/40*; C07D *487/14*

U.S. Cl. 514—338 **20 Claims**

1. A compound selected from the group having Formula I or Formula II:





wherein:

Alk_1 is a straight or branched chain alkylene group having 1 to 6 carbon atoms when R^7 is joined thereto through a carbon atom thereof, and 2 to 6 carbon atoms when R^7 is joined thereto through a sulfur, oxygen, or nitrogen atom thereof, and R^7 and —SS— are in that instance joined to different carbon atoms,

Alk_2 is a straight or branched chain alkylene group having 2 to 6 carbon atoms optionally bearing an R^7 substituent wherein the sulfur and nitrogen atoms connected thereto and any optional R^7 substituent connected thereto through oxygen sulfur or nitrogen are attached to different carbon atoms of Alk_2,

Alk_1 and Alk_2 may contain a double bond,

R is hydrogen, lower alkyl, lower alkanoyl, benzoyl, or substituted benzoyl wherein said substituent is lower alkyl, lower alkoxy, halo, amino, or nitro,

R^7 is selected from the group consisting of hydroxy, halo, amino, alkylamino or dialkylamino having 1 to 12 atoms, alkanoylamino, benzoylamino or A-substituted benzoylamino, naphthoylamino or A-substituted naphthoylamino, cycloalkyl or A-substituted cycloalkyl each having 3 to 8 ring members, cycloalkenyl or A-substituted cycloalkenyl each having 5 to 8 ring members, phenyl or A-substituted phenyl, naphthyl or A-substituted naphthyl, an unsubstituted, or methyl-, or nitro-substituted heterocyclic group selected from 2-pyridyl, 3-pyridyl, 4-pyridyl, or 2-imidazolylmethyl, alkoxy or alkythio each having 1 to 6 carbon atoms, carboxy, alkoxycarbonyl having 1 to 7 carbon atoms, phenoxycarbonyl or A-substituted phenoxycarbonyl, phenoxy, or A-substituted phenoxy, naphthoxy or A-substituted naphthoxy, alkoxycarbonylamino having 2 to 6 carbon atoms, guanidino, ureido (—NHCONH), N-alkylureylene (—NHCONHalkyl) having 2 to 7 carbon atoms, N^3-haloalkylureylene having 3 to 7 carbon atoms, N^3-haloalkyl-N^3-nitrosoureylene having 3 to 7 carbon atoms, and dialkylaminocarbonyl having 3 to 13 carbon atoms, wherein said A substituent is selected from the group consisting of one or two lower alkyl, lower alkanoyl, lower alkoxy, halo, amino, hydroxy, or nitro groups, and

R^8 is selected from the group consisting of alkyl having 1 to 12 carbon atoms, alkenyl or alkynyl each having 3 to 12 carbon atoms, cycloalkyl having 3 to 8 ring members, A-substituted cycloalkyl having 3 to 8 ring members, cycloalkenyl having 5 to 8 ring members, phenyl, A-substituted phenyl, naphthyl, A-substituted naphthyl, an unsubstituted, or methyl-, or nitro-substituted heterocyclic group selected from 2-pyridyl, 3-pyridyl, 4-pyridyl, or 2-imidazolylmethyl, wherein said A substituent is selected from the group consisting of one or two lower alkyl, lower alkanoyl, lower alkoxy, halo, amino, hydroxy, or nitro groups, and R^8 and the adjacent sulfur atom together constitute S-cysteinyl wherein said S-cysteinyl group may be esterified, or salified.

4,803,213
METHOD FOR PRODUCTION OF STABLE NICORANDIL PREPARATION

Yoshimitsu Iida; Takashi Terazono, both of Saitama, and Shuji Sumida, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 805,290, Dec. 5, 1985, abandoned. This application Jan. 21, 1988, Ser. No. 147,129

Claims priority, application Japan, Dec. 17, 1984, 59-265888; Jun. 26, 1985, 60-213277; Jul. 8, 1985, 60-149688

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—355 5 Claims

1. A stable pharmaceutical composition comprising a therapeutic amount of nicorandil in admixture with a pharmaceutically acceptable and excipiently effective amount of a jet-milled sugar having an average particle size of about 3–10 microns selected from the group consisting of mannitol, lactose, sucrose, glucose, galactose, maltose and fructose.

2. A stable pharmaceutical composition comprising a therapeutic amount of nicorandil in admixture with an amount of powder organic acid effective to stabilize said pharmaceutical preparation to humidity, said organic acid being selected from the group consisting of fumaric acid, oxalic acid, salicylic acid, tartaric acid and glutaric acid.

4,803,214
FUNGICIDAL ACTIVE COMPOUND COMBINATIONS

Wilhelm Brandes, Leichlingen; Paul Reinecke, Leverkusen; Helmut Kaspers, Leverkusen; Hans Scheinpflug, Leverkusen, and Jörg Stetter, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,822

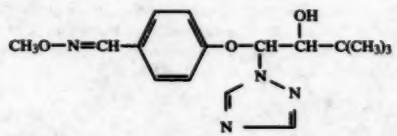
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701715

Int. Cl.[4] A01N *41/02, 43/64*

U.S. Cl. 514—383 2 Claims

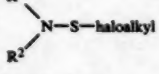
1. A fungicidal composition comprising a fungicidally effective amount of 3,3-dimethyl-1-(4-methoximinomethylphenoxy)-1-(1,2,4-triazol-1-yl)-butan-2-ol of the formula

(I)

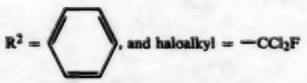


and at least one member selected from the group consisting of a polyhalogenoalkylthio derivative of the formula

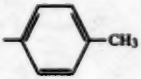
(II)



wherein $R^1 = (CH_3)_2N—SO_2—$, (IIa)



(DICHLOFLUANID) and (IIb)

wherein $R^1 = (CH_3)_2—N—SO_2—$, R^2 = 

and haloalkyl = CCl_2F

-continued
(TOLYFLUANID).

wherein the ratio of I:II is 1:0.05 to 10 parts by weight.

4,803,215
5-HETEROCYCLYL-1-ARYL-PYRAZOLES, COMPOSITION CONTAINING THEM, AND METHOD OF USING THEM TO COMBAT INSECTS, ACARIDS AND NEMATODES

Uta Jensen-Korte, Duesseldorf; Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jürg Stetter, Wuppertal; Heinz-Jürgen Wroblowsky, Langenfeld; Benedikt Becker, Mettmann; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

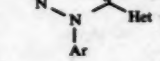
Filed Dec. 16, 1986, Ser. No. 942,476

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3545036

Int. Cl.[4] A02N *43/56, 43/653;* C07D *403/04*

U.S. Cl. 514—407 18 Claims

1. A 5-heterocyclyl-1-aryl-pyrazole of the formula



in which

R^1 represents in each case straight-chain or branched alkyl or haloalkyl having 1 to 4 carbon atoms and, if appropriate, 1 to 9 identical or different halolatoms or represents hydrogen,

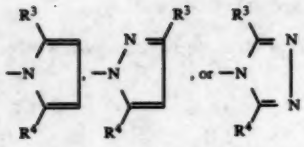
R^2 represents in each case straight-chain or branched alkyl, alkenyl or alkinyl having in each case up to 8 carbon atoms, represents in each case straight-chain or branched haloalkyl or haloalkenyl having in each case up to 8 carbon atoms and up to 17 identical or different haloatoms, represents cycloalkyl having 3 to 7 carbon atoms or represents in each case optionally singly or multiply, identically or differently substituted phenylalkyl or phenyl having, if appropriate, 1 to 4 carbon atoms in the straight-chain or branched alkyl part, phenyl substituents in each case being halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl, haloalkyl, haloalkoxy, haloalkylsulphinyl or haloalkylsulphonyl having in each case 1 to 4 carbon atoms in the individual alkyl parts and, if appropriate, 1 to 9 identical or different haloatoms,

Ar represents in each case optionally singly or multiply, identically or differently substituted phenyl, 2-pyridyl, 3-pyridyl or 4-pyridyl, substituents being cyano, nitro, halogen, in each case straight-chain or branched alkyl, alkoxy or alkoxycarbonyl having in each case up to 4 carbon atoms, in addition in each case straight-chain or branched haloalkyl or haloalkoxy having in each case up to 4 carbon atoms and up to 9 identical or different haloatoms or an $S(O)_m—R^7$ radical,

R^7 represents amino, or in each case straight-chain or branched alkyl, alkylamino, dialkylamino or haloalkyl having in each case up to 4 carbon atoms in the individual alkyl parts and, in the case of the haloalkyl, having up to 9 identical or different haloatoms,

m and n each independently represents a number 0, 1 or 2, and

Het represents



where

R^3 and R^4, independently of one another, represent in each case hydrogen, straight-chain or branched alkyl having 1 to 4 carbon atoms, or phenyl.

13. A method of combating insects, arachnids or nematodes which comprises applying thereto or to a habitat thereof an insecticidally, arachnicidally or nematocidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,803,216

PYRAZOLE-3-AMINES AS ANTI-INFLAMMATORY AGENTS

Richard A. Appleton, Wycomb Nr Melton Mowbray; John Dixon, Great Dalby, and Sidney C. Burford, Loughborough, all of England, assignors to Fisons plc, Ipswich, England

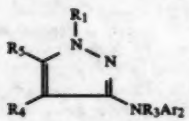
Filed May 5, 1987, Ser. No. 46,656

Claims priority, application United Kingdom, May 7, 1986, 8611102; Dec. 24, 1986, 8630906

Int. Cl.[4] A61K *31/415;* **C07D** *231/38*

U.S. Cl. 514—407 **10 Claims**

1. A compound having the formula



(I)

in which

R_1 represents hydrogen, alkyl, alkanoyl or alkyl substituted by Ar_1,

R_3, R_4 and R_5, which may be the same or different, each independently represent hydrogen, alkyl or Ar_3,

Ar_1, Ar_2 and Ar_3, which may be the same or different, independently represent phenyl or phenyl substituted by one or more of alkyl, hydroxy, alkoxy, NR_6R_7 or halogen,

R_6 and R_7, which may be the same or different, independently represent hydrogen or alkyl,

provided that

(i) when R_1, R_3 and R_4 each represent hydrogen, and R_5 represents methyl, then Ar_2 does not represent phenyl or phenyl substituted by alkyl, alkoxy or halaogen and

(ii) when R_1, R_3 and R_4 each represent hydrogen and AR_2 represents phenyl or phenyl substituted by alkyl, then R_5 does not represent phenyl or phenyl substituted by alkyl, alkoxy or halogen, and

(iii) when R_1 and R_3 represent hydrogen, and Ar_2 represents pheyl, then,

(a) R_4 and R_5 do not both represent phenyl and

(b) R_5 does not represent hydrogen when R_4 represents alkyl,

and pharmaceutically acceptable acid addition salts thereof.

4,803,217

HAPALINDOLINONE COMPOUNDS AS VASSOPRESSIN ANTAGONISTS

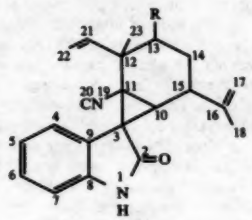
Robert E. Schwartz, Westfield; Charles F. Hirsch, Sommerville; Janet M. Sigmund, Linden, all of N.J., and Douglas J. Pettibone, Chalfont, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 24, 1986, Ser. No. 946,545

Int. Cl.[4] C07D *209/96;* **A61K** *31/40;* **C12P** *17/10*

U.S. Cl. 514—409 **5 Claims**

1. The compounds having the Formula IA and IB:



IA R = Cl
IB R = H

4,803,218

3-AMINOALKYL-1H-INDOLE-5-UREA AND AMIDE DERIVATIVES

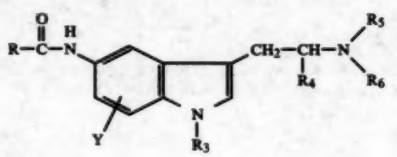
Kerry G. Stanley, Lansdale, and Winston Ho, Hatfield, both of Pa., assignors to McNeilab, Inc., Spring House, Pa.

Filed Sep. 29, 1982, Ser. No. 427,024

Int. Cl.[4] C07D *209/16, 401/14, 401/12;* **A61K** *31/40*

U.S. Cl. 514—414 **11 Claims**

1. A method of treating hypertension in an animal comprising administering to the animal, a hypertension reducing amount of a pharmaceutical composition of a pharmaceutically-acceptable carrier and a 3-aminoalkyl-1H-indole-5-urea compound of the following formula (1):



(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein:

R is represented by R_1R_2N—;

R_1 is H, or C_{1-4} loweralkyl, phenyl or cycloalkyl;

R_2 is H or a C_{1-4} loweralkyl;

Y is H or halo;

R_3 is H or a C_{1-4} loweralkyl;

R_4 is H or a C_{1-4} loweralkyl;

R_5 is H, a C_{1-4} loweralkyl, a C_{1-4} loweralkylcarbonyl or $COCH_2CF_3$, and

R_6 is H or a C_{1-4} loweralkyl; or

R_5 and R_6 are taken together as a N-loweralkylpyrrolidinylidene group.

2. N-[3-(2-aminoethyl)-1H-indol-5-yl]urea or a pharmaceutically acceptable acid addition salt thereof.

11. N-[3-(2-Aminoethyl)-1H-indol-5-yl]urea.

4,803,219

1,3-PROPANEDIAMINE DERIVATIVES AND ANTIAUHYTHNIC PHARMACEUTICAL COMPOSITION CONTAINING THEM

Michel Combourieu; Nadine Simbille; Marie-Paule Landes, all of Aurillac, and Yvon Bernet, Jussac, all of France, assignors to RIOM Laboratories C.E.R.M., Riom, France

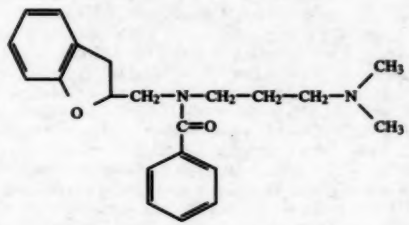
Filed Jul. 21, 1987, Ser. No. 76,082

Claims priority, application France, Jul. 22, 1986, 86 10638

Int. Cl.[4] A61K *31/34;* C07D *307/81*

U.S. Cl. 514—469 5 Claims

1. N,N-dimethyl-N'-benzoyl-N-(2,3-dihydrobenzofuran-2-ylmethyl)1,3-propanediamine of the formula:



in its enantiomerically pure and mixed forms, and their pharmaceutically acceptable salts.

4,803,220

PHARMACEUTICAL AGENTS

Andrew G. Brewster, Bollington; George R. Brown, Wilmslow, and Michael J. Smithers, Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, United Kingdom

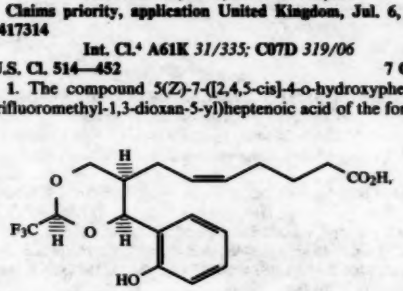
Filed Jun. 28, 1985, Ser. No. 750,101

Claims priority, application United Kingdom, Jul. 6, 1984, 8417314

Int. Cl.[4] A61K *31/335;* C07D *319/06*

U.S. Cl. 514—452 7 Claims

1. The compound 5(Z)-7-([2,4,5-cis]-4-o-hydroxyphenyl-2-trifluoromethyl-1,3-dioxan-5-yl)heptenoic acid of the formula



1

in racemic or laevorotatory optically active form; or a salt thereof.

4,803,221

ANTHRACENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 661,802, Oct. 17, 1984, Pat. No. 4,719,099, which is a continuation-in-part of Ser. No. 499,332, May 31, 1983, abandoned. This application Aug. 28, 1987, Ser. No. 90,569

Int. Cl.[4] C07C *93/00, 87/78, 87/64*

U.S. Cl. 514—510 11 Claims

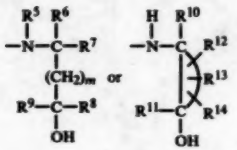
1. A pharmaceutical formulation containing a compound of formula (I)

$$ArCH_2R^1 \quad (I)$$

or a monomethyl or monoethyl ether thereof, the compound of formula (I) including its ethers containing no more than 30 carbon atoms in total); ethers, esters thereof; acid addition salts thereof; wherein

Ar is an anthracene ring optionally substituted by one or two substituents. The substituents will contain not more than four carbon atoms in total when taken together being the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer 0, 1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the anthracene ring is optionally substituted by a group NR^3R^4 containing not more than 5 carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl group;

R^1 contains not more than eight carbon atoms and is a group



wherein

m is 0 or 1;

R^5 is hydrogen;

R^6 and R^7 are the same or different and each is hydrogen or C_{1-3} alkyl optionally substituted by hydroxy (proving that at least one hydroxy group is present);

R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;

is a five- or six-membered saturated carbocyclic ring;

R^{10} is hydrogen, methyl or hydroxymethyl;

R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;

R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl, except 2-((10-(2-hydroxyethyloxy)-9-anthracenylmethyl-)amino-2-methyl-1,3-propanediol with a pharmaceutically acceptable carrier in the form of a tablet, capsule, syrup, or solution.

4,803,222

FLUORANTHENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 661,674, Oct. 17, 1984, Pat. No. 4,720,587, which is a continuation-in-part of Ser. No. 496,853, May 23, 1983, Pat. No. 4,532,344. This application Aug. 28, 1987, Ser. No. 90,696

Claims priority, application United Kingdom, May 16, 1984, 84105584

Int. Cl.[4] C07C *62/2, 87/78*

U.S. Cl. 514—510 9 Claims

1. A pharmaceutical formulation containing a compound of formula (I)

$$ArCH_2R^1 \quad (I)$$

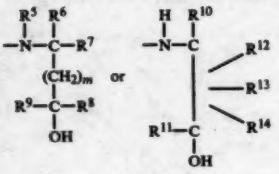
or a monomethyl or monoethyl ether thereof, the compound of formula (I) including its ethers containing no more than 30 carbon atoms in total); ethers, esters thereof; acid addition salts thereof;

wherein

Ar is a fluoranthene ring optionally substituted by one or two substituents. The substituents will contain not more than four carbon atoms in total when taken together being

the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer 0,1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the fluoranthene ring is optionally substituted by a group NR^3R^4 containing not more than 5 carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl group;

R^1 contains not more than eight carbon atoms and is a group



wherein

m is 0 or 1;

R^5 is hydrogen;

R^6 and R^7 are the same or different and each is hydrogen or C_{1-3} alkyl optionally substituted by hydroxy (providing that at least one hydroxy group is present);

R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;

—C—C— is a five- or six-membered saturated carbocyclic ring;

R^{10} is hydrogen, methyl or hydroxymethyl;

R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;

R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl with a pharmaceutically acceptable carrier in the form of a tablet, capsule, syrup, or a solution for injection except that the formulation does not include 2-((3-fluoranthenylmethyl)amino)-2-methyl-1,3-propanediol or a pharmaceutically acceptable salt thereof.

4,803,223

SUBSTITUTED AMINOPHENYL UREA DERIVATIVES

Shozo Kato, Fujisawa, Japan, assignor to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

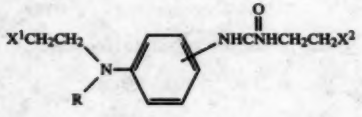
Filed Feb. 20, 1986, Ser. No. 831,266

Claims priority, application Japan, Feb. 21, 1985, 60-31510

Int. Cl.[4] C07C *149/437, 127/19*; A61K *31/10, 31/17*

U.S. Cl. 514—521 **22 Claims**

1. A substituted aminophenylurea derivative represented by the formula



(I)

wherein X^1 and X^2 are identical or different and each represents a halogen atom, and

R is selected from the group consisting of C_1–C_6 alkyl, halo C_1–C_6 alkyl), C_1–C_6 alkoxy C_1–C_6 alkyl, C_1–C_6 alkylthio C_1–C_6 alkyl, phenoxy(C_1–C_6 alkyl), cyano(C_1–C_6 alkyl), C_2–C_6 alkenyl, halo(C_2–C_6 alkenyl), C_1–C_6 alkoxy C_2–C_6 alkenyl, C_1–C_6 alkylthio C_2–C_6 alkenyl, phenoxy C_2–C_6 alkenyl, cyano(C_2–C_6 alkenyl) and C_2–C_6 alkynyl, or an acid addition salt thereof.

19. A pharmaceutical composition comprising a tumor-inhibiting amount of a substituted aminophenylurea derivative of formula (I) given in claim 1 or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable adjuvant.

4,803,224

ANTIVIRAL ANTIBIOTIC COMPLEX

Osamu Tenmyo, Yokohama; Hiroaki Ohkuma, Tokyo, and Masataka Konishi, Kawasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed May 1, 1986, Ser. No. 857,878

Int. Cl.[4] C07C *103/50*; A61K *31/195*

U.S. Cl. 514—563 **2 Claims**

1. The antiviral antibiotic complex designated BU-2231 V or a pharmaceutically acceptable acid addition salt thereof comprising a complex of γ-homopolymers of D-α,γ-diaminobutyric acid, which antibiotic complex when purified and lyophilized is in the form of a white amorphous solid having (1) a melting point of about 165–167 deg. C., (2) a specific optical rotation $[\alpha]^{25}$ of −19 deg. (c 1.0, H_2O), (3) an elemental analysis corresponding to the formula $C_4H_8N_2O.1/3\ H_2CO_3$ of C-43.80% (43.08 calcd), H-7.84% (7.23 calcd), and N-23.00% (23.18 calcd), (4) an average molecular weight of about 5,700 when determined by gel filtration analysis and about 5,100-5,200 when determined by the dinitrophenylation method, and (5) an Rf value in thin layer chromatography analysis using silica gel of 0.02 with chloroform-methanol-28% aqueous ammonium hydroxide-water (1:4:2:1) and of 0.72 with chloroform-methanol-28% aqueous ammonium hydroxide, upper layer (1:1:1); which antibiotic complex is readily soluble in water and dimethyl sulfoxide, slightly soluble in methanol and ethanol, and only negligibly soluble in other organic solvents; which gives a positive response to ninhydrin, Dragendorff and Rydon-Smith reagents and a negative response to ferric chloride and anthrone reagents; which antibiotic complex gives an infrared spectrum substantially as shown in FIG. 1 which indicates amino (3400 cm^{-1}) and amide (1640 and 1540 cm^{-1}) functional groups when pelleted in potassium bromide and a high pressure liquid chromatographic spectrograph substantially as shown in FIG. 2; and which is effective in inhibiting growth of bacteria and viruses.

4,803,225

DIHYDROXY-PHENETHYLAMINO COMPOUNDS USEFUL AS PHARMACEUTICALS

John Dixon, Melton Mowbray, and Francis Ince, Loughborough, both of United Kingdom, assignors to Fisons, plc, Ipswich, England

Division of Ser. No. 662,393, Oct. 18, 1984, Pat. No. 4,720,586.

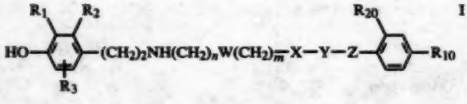
This application Dec. 2, 1987, Ser. No. 127,366

Claims priority, application United Kingdom, Dec. 6, 1983, 8332447; Dec. 6, 1983, 8332448; Dec. 6, 1983, 8332452; Jan. 24, 1984, 8401746; Jan. 24, 1984, 8401747; Jan. 24, 1984, 8401748; Jan. 24, 1984, 8401750

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—654 **7 Claims**

1. A method of treatment of congestive heart failure, renal failure, angina pectoris, ischaemic heart disease, hypertension, reversible obstructive airways disease, hyperprolactinaemia, Parkinson's disease, glaucoma or gastric hypersecretion, which comprises administration to a patient suffering from such a condition of a therapeutically effective amount of a compound of formula I,



I

in which R_1 represents OH,

R_2 and R_3, which may be the same or different, each independently represent hydrogen, fluorine, chlorine, bromine, alkyl C_1 to C_6, nitro, nitrile, $(CH_2)_pR_9$ or SR_9,

W represents a single bond, a 1,2-, 1,3- or 1,4-disubstituted benzene ring; a —CH=CH— group or a 1,4-cyclohexanediyl group;
X represents NH;
Y represents $(CH_2)q$ and R_{20} represents hydrogen, or Y represents CR_{15} $R_{16}CR_{17}R_{18}$, wherein the carbon atom bearing R_{15} and R_{16} is adjacent to X and in which
R_{17} and R_{18}, together with the carbon atom to which they are attached form a carbonyl group, and R_{15}, R_{16} and R_{20} each represent hydrogen, or
R_{15} and R_{20} together form a chain $—CH_2—$, and R_{16}, R_{17} and R_{18} each represent hydrogen, or
R_{15}, R_{16}, R_{17}, and R_{18} each independently represent hydrogen or alkyl C_1 to C_6 and R_{20} represents hydrogen;
Z represents a single bond, NR_{19}, CH_2, O, CO, S or SO_2,
in which R_{19} represents hydrogen or alkyl C_1 to C_6;
n and m each independently represent an integer from 1 to 4 inclusive;
q represents an integer from 1 to 3 inclusive;
p represents 0 or an integer from 1 to 3 inclusive;
R_9 represents phenyl or phenyl substituted by hydroxy, and
R_{10} represents hydrogen or chlorine,
provided that
(i) when R_2 and R_3 both represent hydrogen, Z represents a single bond or CH_2, and R_{20} represents hydrogen,
then W does not represent a single bond, and
(ii) when R_2 and R_3 both represent hydrogen, W represents a single bond and Z represents CH_2,
then R_{15} does not form a chain $—CH_2—$ with R_{20}, or
a pharmaceutically acceptable derivative thereof.

4,803,226

ANTHRACENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 725,157, Apr. 22, 1985, Pat. No. 4,719,047, which is a continuation of Ser. No. 499,332, May 31, 1983, abandoned. This application Jan. 6, 1988, Ser. No. 141,199
Int. Cl.[4] C07C *93/00, 87/28, 87/64*
U.S. Cl. 514—655 **7 Claims**

1. A pharmaceutical composition in the form of a tablet or capsule containing or a 2-((10-(2-hydroxyethyloxy)-9-anthracenylmethyl)amino)-2-methyl-1,3-propanediol or a pharmaceutically acceptable salt thereof together with a pharmaceutically acceptable carrier therefor.

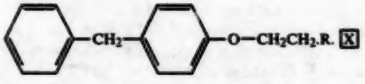
4,803,227

AMINOALKYL ETHERS OF PHENOLS AS ANTICANCER AGENTS FOR THE BREAST AND COLON

Lorne J. Brandes, Winnipeg, and Mark W. Hermonat, Mississauga, both of Canada, assignors to The University of Manitoba, Winnipeg, Canada

Continuation-in-part of Ser. No. 699,265, Feb. 7, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 70,207
Claims priority, application Canada, Feb. 14, 1984, 447369
Int. Cl.[4] A61K *31/135, 31/535*
U.S. Cl. 514—651 **5 Claims**

1. A pharmaceutical composition comprising
(a) about 1 to about 10 parts of a compound of the formula:



where R is

wherein R_1 and R_2 are ethyl groups and X when present, is a physiologically-acceptable salt forming acid; and,
(b) about 1 part of 1-(p-β-dimethylaminoethoxyphenyl)-trans-1,2-diphenyl-but-1-ene or a physiologically acceptable salt thereof.

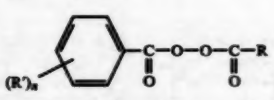
4,803,228

UNSATURATED AROMATIC PEROXIDES AND THEIR USE IN PHARMACEUTICAL AND COSMETIC COMPOSITIONS

Bernard Jacquet, Antony; Michel Hocquaux, Paris; Didier Semeria, Gif Sur Yvette, and Didier Saint-Leger, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Sep. 29, 1987, Ser. No. 102,492
Claims priority, application France, Sep. 30, 1986, 86 13606
Int. Cl.[4] A61K *31/075;* C07C *179/18, 179/00*
U.S. Cl. 514—714 **14 Claims**

6. A pharmaceutical or cosmetic composition comprising in a pharmaceutically or cosmetically acceptable carrier for topical application to the skin, at least one peroxide having an aromatic radical and an unsaturated radical and having the formula:



(I)

wherein
R represents linear or branched, mono- or polyunsaturated alkenyl having 5 to 21 carbon atoms or cycloalkenyl having 5 to 10 carbon atoms,
n is 1 or 2 and
R' represents hydrogen, halogen, $—CF_3$, methoxy, ethoxy or acyl having 2 to 16 carbon atoms.

4,803,229

MODIFIED POLYISOCYANATE COMPOSITIONS AND MOLDED FLEXIBLE POLYURETHANE FOAM

Thirumurti Narayan, Grosse Ile; Edward R. Pray, Dearborn, and John R. Stoll, Woodhaven, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Jan. 6, 1986, Ser. No. 816,400
Int. Cl.[4] C08G *18/79*
U.S. Cl. 521—160 **22 Claims**

1. A process of producing a flexible polyurethane foam having improved air flow and compression set consisting of reacting a polyol having an equivalent weight from 1000 to 3000 and a urea-biuret modified polyisocyanate mixture in the presence of a blowing agent and a urethane catalyst wherein said polyisocyanate mixture is composed of toluene diisocyanate and urea-biuret modified polymeric diphenylmethane diisocyanate.

4,803,230

POLYOLS-POLYESTERS AND USE THEREOF IN THE PRODUCTION OF POLYURETHANE FOAMS

Renato Moroni, Arese, and Marino Brocci, Gallarate, both of Italy, assignors to Montedipe S.p.A., Milan, Italy

Filed Nov. 23, 1987, Ser. No. 124,680
Claims priority, application Italy, Nov. 28, 1986, 22494 A/86
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—168 9 Claims

1. Polyols-polyesters obtained by esterification and transesterification of DMT process residues with a polyol wherein at least 5% by weight of the polyol is constituted by a glycol have the formula:

$$HO—R—OH \quad (I)$$

wherein R is a halogen- and/or phosphorus-containing aliphatic, aromatic, cycloaliphatic or alkyl-aromatic radical.

4,803,231

THERMOPLASTIC COMPOSITIONS WITH VERY HIGH CONTENT OF PULVERULENT MINERAL MATERIALS FOR INCORPORATION INTO POLYMERS

Henri Seinera, Oullins; Patricia Luberne, Gennevilliers; Claude Stock, Champs-Sur-Marne, and Patrick Trouve, Clamart, all of France, assignors to Pluess Staufer A. G., Oftringen, Switzerland

Filed Oct. 29, 1985, Ser. No. 792,523
Claims priority, application France, May 21, 1985, 85 07819
Int. Cl.[4] C08K 5/52, 3/34, 3/26
U.S. Cl. 523—219 13 Claims

1. A coherent thermoplastic aggregate with very high content of pulverulent mineral materials comprising:

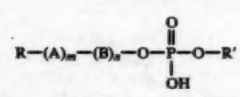
(a) 19.99 to 4.05 wt. % of at least one polyolefin polymer or copolymer having a fusion or softening temperature of at least 60° C. and an index of fluidity of at least 50,

wherein said polyolefin polymer or copolymer is selected from the group consisting of linear or branched low density polyethylenes; high density polyethylenes; polypropylene homopolymers; polyisobutylenes; copolymers obtained by copolymerization of at least two monomers selected from the group consisting of ethylene, propylene, and isobutylene; halogenated polyolefins, and polypropylene modified by grafting or copolymerization with EPDM or SEBS,

(b) 80–95 wt. % of a pulverulent mineral material, present in an amount of 400 to 1900 parts by weight per 100 parts by weight of the said polyolefin polymer or copolymer,

said pulverulent mineral material having a particular size distribution such that 95% of the particles have at least one dimension <30 microns; and

(c) as a fluidifacient agent in an amount of 0.01 to 0.95 wt. % of a phosphate having the following formula:



where A represents ethylene oxide; B represents propylene oxide; $0 \leqq (m+n) \leqq 24$; R represents a linear or nonlinear alkyl group which may be saturated or unsaturated, an aryl group, a saturated or unsaturated heterocycle, wherewith said alkyl, aryl, or heterocycle has 5–28 C atoms, or R is a steroid group; and R′ is hydrogen, a carbon chain having 1–4 C atoms, or a group R as defined above; and wherein said aggregate has a density near to the theoretical density of said pulverulent mineral material while still providing excellent compatibility with said polymer or copolymer, and wherein the interparticle voids between the grains of said mineral material are filled by at least one said polymer or copolymer.

4,803,232

RUBBER-MODIFIED EPOXY ADHESIVE COMPOSITIONS

Dilipkumar N. Shah, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Jul. 30, 1987, Ser. No. 79,414
Int. Cl.[4] C08K 5/05; C08L 9/02, 63/00
U.S. Cl. 523—456 12 Claims

1. An adhesive composition comprising a Component A comprising

(a) about 50 to 95 parts by weight of at least one epoxy resin having more than one epoxy group, and

(b) about 5 to 50 parts by weight of acrylate or methacrylate ester of aliphatic polyhydric alcohol and as a curing agent Component B comprising

(c) an amine-terminal butadiene-acrylonitrile rubber;

(d) at least one aliphatic or aromatic polyamine; and

(e) at least one polyamidoamine derived from dimerized fatty acids of 12 to 28 carbon atoms and aliphatic amines;

wherein the amount of (c) is about 5 to 40 weight percent, the amount of (d) is about 2 to 30 weight percent and the amount of (e) is about 8 to 30 weight percent, the amount of (c) through (e) being based on the total weight of (a), (b), (c), (d) and (e).

8. An adhesive composition according to claim 1 including about 1.0 to 5.0 parts of a polyol per 100 parts of Component A and about 100 to 400 parts of activated silica per 100 parts of polyol.

4,803,233

WATER-BASED SILICONE-ORGANIC POLYMER COMPOSITIONS AND METHOD THEREFOR

Dipak Narula, Midland, and Terence J. Swihart, Essexville, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 30, 1987, Ser. No. 115,493
Int. Cl.[4] C08K 50/07
U.S. Cl. 524—58 24 Claims

1. A process for preparing a silicone-organic polymer composition, said process comprising mixing components comprising (A) an aqueous, silicon compound emulsion composition and (B) an aqueous, organic polymer composition to provide a silicone-organic polymer composition wherein the weight ratio of said silicon compound to said organic polymer has a value of from 1/100 to 100/1, said aqueous, silicon compound emulsion composition comprising (i) an aqueous phase consisting essentially of at least 10 parts by weight of water and (ii) an oil phase consisting essentially of 100 parts by weight of a silicon compound having the average formula $R_cSiO_{(4-c)/2}$ wherein each R denotes a monovalent, silicon-bonded radical selected from the group consisting of the hydrogen atom, alkoxy radicals, hydroxy radicals, hydrocarbon radicals and substituted hydrocarbon radicals, the substituents of which are selected from radicals containing one or more atoms selected from the group consisting of nitrogen, oxygen, sulfur and halogen, there being at least one R radical per molecule of said silicon compound selected from the group consisting of hydroxy radicals and alkoxy radicals; has a value of from 1 to 4; and said aqueous phase and/or said oil phase further containing, in total,

(1) at least 3 millimols of a nonionic primary surfactant having an HLB number of from 13 to 15,

(2) from 1 to 5 millimols, per millimol of said nonionic primary surfactant, of a nonionic secondary surfactant having an HLB number of from 7 to 9 and

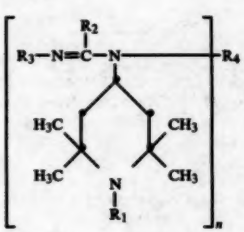
(3) at least 0.05 millimol of a nonionic tertiary surfactant having an HLB number of at least 16.

4,803,234
PIPERIDINE COMPOUNDS AND THEIR USE AS ANTI-OXIDATIVE, LIGHT OR THERMAL INDUCED DEGRADATION AGENTS

Giuseppe Cantatore, Bitonto, and Valerio Borzatta, Bologna, both of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

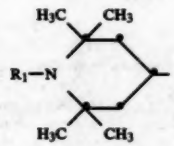
Filed Jan. 29, 1987, Ser. No. 8,220
Claims priority, application Italy, Jan. 30, 1986, 19230 A/86
Int. Cl.[4] C08J 5/34; C09K 15/16; C07D 251/40
U.S. Cl. 524—100 18 Claims

1. A compound of formula I



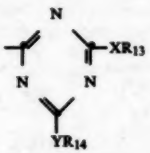
(I)

in which R_1 is hydrogen, O˙, CN, NO, cyanomethyl, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or C_3–C_{12}-alkynyl subject to the proviso that the carbon atom attached to the nitrogen atom is a primary carbon atom, C_7–C_{12}-aralkyl, C_1–C_{12}-alkanoyl, C_3–C_{12}-alkenoyl, C_3–C_{12}-alkynoyl, benzoyl or benzoyl substituted by one or more of C_1–C_4-alkyl or —OH 2,3-epoxypropyl, OH-monosubstituted C_2–C_6-alkyl or 2,3-dihydroxypropyl, R_2 is hydrogen, C_1–C_{18}-alkyl, C_5–C_{18}-cycloalkyl, C_6–C_{18}-aryl or C_7–C_{18}-aralkyl, R_3 is C_6–C_{18}-aryl or a group of the formula (II)



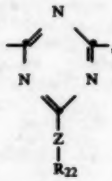
(II)

in which
R_1 is as defined above,
n is an integer from 1 to 3, and
R_4 is a triazinyl radical of a valency equal to n, with the proviso that when n is 1, R_4 is



where R_{13} and R_{14} are independently C_1–C_{18}-alkyl, C_2–C_6-alkyl substituted by OH, by C_1–C_{18}-alkoxy or by C_2–C_{18}-dialkylamino; C_5–C_{18}-cycloalkyl, C_3–C_{18}-alkenyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a group of formula II, or R_{13} and R_{14} are hydrogen, and
X and Y are independently a direct bond, —O— or

where R_{16} is hydrogen, C_1–C_{18}-alkyl, C_5–C_{18}-cycloalkyl, C_3–C_{18}-alkenyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a group of formula II, or R_{16} is OH-monosubstituted C_2–C_6-alkyl, or the groups $R_{13}X$ and $R_{14}Y$ are independently 1-pyrrolidinyl, 1-piperidyl or 4-methyl-1-piperazinyl,
when n is 2, R4 is



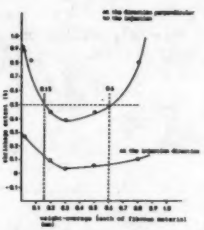
where
R_{22} is as defined for R_{13} and R_{14},
Z is as defined for X and Y, or —ZR_{22} is 1-pyrrolidinyl, 1-piperidyl, 4-methyl-1-piperazinyl or halogen, and
when n is 3, R_4 is a 1,3,5-triazine-2,4,6-triyl group.

14. A composition of matter comprising a synthetic polymer subject to oxidative, thermal or light induced degradation stabilized with an effective stabilizing amount of a compound of claim 1.

4,803,235
COMPOSITION FOR INJECTION MOLDING

Tsuneyoshi Okada, Kawasaki, Japan, assignor to PolyPlastics Co., Ltd., Osaka, Japan

Filed Oct. 16, 1987, Ser. No. 108,997
Claims priority, application Japan, Oct. 17, 1986, 61-247097
Int. Cl.[4] C08K 7/14, 7/06
U.S. Cl. 524—494 6 Claims



1. A resin composition which comprises 40 to 80 percent by weight of a thermotropic, liquid crystalline polyester being capable of forming an anisotropic phase in the molten state and having a weight-average molecular weight of 2,000 to 20,000 and 20 to 60 percent by weight of a fibrous material having a tensile modulus of not less than 6,000 kg/mm^2, a weight-average length of 0.15 to 0.60 mm and an aspect ratio of not less than 10.

4,803,236
STABILIZATION OF AROMATIC POLYESTERS WITH MERCAPTOBENZOTHIAZOLE

Jerold C. Rosenfeld, Tonawanda, N.Y., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 833,938, Feb. 25, 1986, abandoned.
This application Dec. 21, 1987, Ser. No. 135,480
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—83 21 Claims

1. A resin composition comprising:
(A) an aromatic polyester produced by polymerization of a

substantially equimolar mixture of the monomeric components

(a) terephthalic acid and/or an acid halide, dialkyl ester or diaryl ester thereof and/or isophthalic acid and/or an acid halide, dialkyl ester or diarly ester thereof, with he terephalic acid unit/isophthalic acid unit mole ratio being about 9:1 to aobut 1:9, and

(b) bisphenol A or a metal salt or diester of said bisphenol, said aromatic polyester being essentially the sole resinous component of said composition and

(B) about 0.01 to less than about 2% by weight, based on the aromatic polyester (A) of a stabilizer comprising 2-mercaptobenzothiazole.

4,803,237

REINFORCED POLYESTER MOLDING COMPOSITIONS

Ronald R. Light, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1988, Ser. No. 158,822

Int. Cl.[4] C08K *5/05*; C08L *67/02*

U.S. Cl. 524—385 **4 Claims**

1. A reinforced polyester molding composition comprising

(a) poly(ethylene terephthalate) having an I.V. of about 0.4–1.0 dl/g,

(b) about 10–60% by weight of the composition of glass fibers,

(c) about 1.0–5.0% by weight of the composition of at least one sodium or potassium salt of a hydrocarbon carboxylic acid of 7–25 carbon atoms or at least one sodium or potassium salt of an ionic hydrocarbon copolymer of an α-olefin of 2–5 carbon atoms and an α,β-ethylenically unsaturated carboxylic acid of 3–5 carbon atoms in which the carboxyl groups have been at least partially neutralized with Na^+ or K^+ cations, and

(d) about 0.5–10% by weight of the composition of a primary linear polymeric alcohol having the structure $CH_3(CH_2)_xCH_2OH$ where x has an average value of 28–48.

4,803,238

POLYMER COMPOSITION

Atsushi Sato, Tokyo; Keiji Endo, Yokosuka; Shigenobu Kawakami, Ichikawa; Eiichi Matsuzaka, Kawasaki, and Satoshi Narui, Ayase, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Japan

Continuation of Ser. No. 885,002, Jul. 14, 1986, abandoned. This application Oct. 29, 1987, Ser. No. 115,548

Claims priority, application Japan, Aug. 3, 1984, 59-163549

Int. Cl.[4] C08C *11/22, 13/04*

U.S. Cl. 524—486 **3 Claims**

1. A polymer composition comprising 100 parts by weight of a polymer selected from the group consisting of an NBR, an ethylene-vinyl acetate copolymer, an acrylic polymer, a urethane polymer, an epoxy polymer, a prepolymer of said polymers and mixtures thereof and 0.1 to 200 parts by weight of a compounding oil comprising a fraction containing a major amount of triaryldialkanes, said fraction characterized by a boiling point range of 350° to 450° C., said fraction of said compounding oil prepared by disproportionating a by-product oil fraction, said fraction containing a major amount of diarylalkanes, characterized by a boiling point range of between 260° and 320° C., said fraction obtained as a by-product of the reaction to prepare alkylated benzene or toluene by the reaction of said benzene or toluene with ethylene in the presence of an alkylation catalyst, said disproportionation reaction occurring at a temperature in the range between 20° and 500° C. in the presence of a disproportionation catalyst.

4,803,239

FLUOROCARBON ELASTOMER ARTICLES HAVING IMPROVED AMINE RESISTANCE

Mark S. Schaberg, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 14, 1987, Ser. No. 95,908

Int. Cl.[4] C08K *3/28*

U.S. Cl. 524—428 **11 Claims**

1. A fluorocarbon elastomer gum composition comprising a peroxide-curable fluorocarbon, elastomer gum with bromine or iodine atom cure sites and, dispersed in the gum, a normally solid, inorganic chloride or bromide salt which imparts amine resistance to the cured fluorocarbon elastomer article prepared from said gum composition.

4,803,240

STYRENE GRAFTED ISOPRENE PSA'S

Charles A. Midgley, Hixson, Tenn., and Orest N. Chick, Sarnia, Canada, assignors to BASF Corporation, Parsippany, N.J.

Filed Dec. 7, 1987, Ser. No. 129,166

Int. Cl.[4] C08J *0/00*

U.S. Cl. 524—504 **4 Claims**

1. An aqueous based pressure sensitive adhesive, which does not contain an organic solvent or diluent comprising per 100 parts by dry weight of a latex of an elastomeric polymer onto which has been grafted a thermoplastic polymer consisting of:

(A) from 70 to 95 weight percent of an elastomer comprising

(i) at least 85 weight percent of isoprene or chloroprene;

(ii) up to 15 weight percent of one or more monomers selected from the group consisting of C_{1-8} alykl and hydroxyalkyl esters of C_{3-6} ethylenically unsaturated carboxylic acids; and

(iii) up to 5 weight percent of one or more monomers selected from the group consisting of

(a) C_{3-6} ethylenically unsaturated carboxylic acid monomers;

(b) C_{3-6} ethylenically unsaturated aldehydes; and

(c) amides of C_{3-6} ethylenically unsaturated carboxylic acids, which amides may be unsubstituted or substituted at the nitrogen atom by up to two radicals selected from the group consisting of C_{1-4} alkyl and hydroxyalkyl radicals; from 40 to 80 weight percent of said elastomer being soluble in tetrahydrofuran and the tetrahydrofuran soluble portion of the elastomer having a median molecular weight from 10^3 to 10^5; and

(B) from 30 to 5 weight percent of a grafted thermoplastic having Tg from 35° C. to 120° C. and which is a polymer of one or more monomers selected from the group consisting of C_{8-12} vinyl or vinylidene aromatic monomers which may be unsubstituted or substituted by a C_{1-4} alkyl radical and C_{1-2} alkyl esters of acrylic and methacrylic acid;

from about 20 to 250 parts by dry weight of an aqueous emulsion of a tackifier resin which is selected from the group consisting of terpene resins, pinene resins, piperylene resins, and isoprene tackifiers.

4,803,241

CONDENSATION POLYMERS CONTAINING STYRYLBENZAZOLE ULTRAVIOLET RADIATION-ABSORBING RESIDUES AND SHAPED ARTICLES PRODUCED THEREFROM

Max A. Weaver; Wayne P. Pruett, both of Kingsport; Samuel D. Hilbert, Jonesborough, and Robert D. Burpitt, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

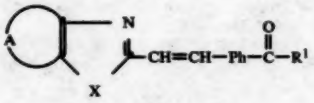
Filed Jul. 20, 1987, Ser. No. 75,374

Int. Cl.[4] C08K *5/35*

U.S. Cl. 524—719 **9 Claims**

1. A composition comprising a molding grade, linear polyester wherein the polyester acid moiety is comprised of at least about 50 mol % terephthalic or 2,6-naphthalenedicarboxylic acid residue, and the glycol moiety at least 50 mol % ethylene

glycol or 1,4-cyclohexanedimethanol residue having reacted or copolymerized therein about 2 to about 1500 ppm the residue of a styrylbenzazole compound or mixture of styrylbenzazole compounds having the formula:



wherein

A is the residue of a benzene ring of a benzoxazole, benzothiazole or benzimidazole radical;

X is —O—, —S—, or —N(R^2)—;

Ph is a phenylene radical; and

R^1 is halogen or —Y—R^2 wherein

Y is —O— or —N(R^2)—; and

each R^2 is hydrogen, alkenyl or an unsubstituted or substituted alkyl, cycloalkyl or aryl radical.

4,803,242

DIAPHRAGM FOR LOUDSPEAKERS

Kousaku Murata, Kobe; Satoshi Takayama, Osaka; Hiroyuki Takewa, Osaka; Shuji Saiki, Osaka, and Tsuneo Tanaka, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 3, 1987, Ser. No. 80,923

Claims priority, application Japan, Aug. 4, 1986, 61-182909

Int. Cl.[4] C08L *1/02, 5/08, 51/02;* H04R *9/06*

U.S. Cl. 524—35 **2 Claims**

1. A loudspeaker diaphragm comprising a uniform mixture of kraft pulp and chitin powder having 50–500 mesh size, and the ratio of said chitin powder in said uniform mixture ranging not larger than 30 weight percent.

4,803,243

BLOCK-GRAFT COPOLYMER

Teruo Fujimoto; Mikio Shiono; Osamu Watanabe, all of Nagaoka, and Koichi Ito, Higashikurume, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1987, Ser. No. 30,074

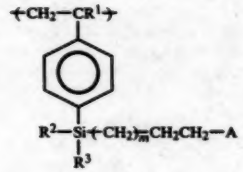
Claims priority, application Japan, Mar. 26, 1986, 61-69366

Int. Cl.[4] C08F *287/00*

U.S. Cl. 525—100 **4 Claims**

1. A block-graft copolymer comprising:

a polymer block having a repeating unit represented by General Formula (I):

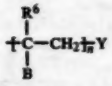


(I)

wherein R^1 represents a hydrogen atom, methyl group or ethyl group; R^2 and R^3 may be the same or different and each represent an alkyl group having 1 to 3 carbon atoms or phenyl group; m represents an integer of 0 to 4; and A represents any one of polymer residual groups represented by General Formulas (II) to (IV) shown below,

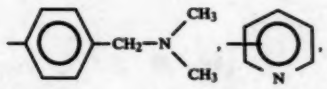
(II)

wherein R^4 may be the same or different and each represent methyl group, ethyl group or phenyl group; R^5 is as defined for R^4 or represents a group represented by the formula —Si(R^4)$_3$; and n is an integer of 1 to 1,000,

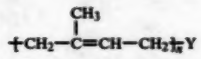


(III)

wherein R^6 represents a hydrogen atom or methyl group; and B represents a group represented by the formula —COOR^2, where R^2 is as defined above,



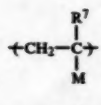
—CH=CH_2 or —C(CH_3)=CH_2; Y represents cumyl group, n-butyl group, s-butyl group or benzophenone residual group; and n is as defined above,



(IV)

wherein Y represents cumyl group, n-butyl group or s-butyl group, and n is as defined above,

and at least one of polymer blocks having a repeating unit represented by General Formula (V):



(V)

wherein R^7 represents a hydrogen atom, methyl group or ethyl group; M represents at least one selected from a group represented by the formula —CH=CH_2, —C(CH_3)=CH_2, —$COOCH_3$ or —$COOC_2H_5$ and phenyl group.

4,803,244

PROCESS FOR THE PREPARATION OF THERMOPLASTIC ELASTOMERS

Jeffrey D. Umpleby, Princeton, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 16, 1987, Ser. No. 120,969

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—105 **15 Claims**

1. A process for the preparation of a thermoplastic elastomer comprising admixing, under reaction conditions, an elastomer containing carbon-carbon double bonds; an essentially saturated thermoplastic homopolymer or copolymer; a multifunctional organosilicon compound containing an average of at least two Si—H groups per molecule; and a catalyst capable of hydrosilylating the carbon-carbon double bonds of the unsaturated elastomer.

4,803,245

FLEXIBILIZED PHENOL/MERCAPTO RESINS AND THEIR SYNTHESIS

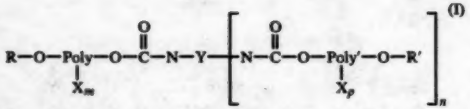
Laurence G. Dammann, Westerville, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 17, 1987, Ser. No. 27,008
Int. Cl.[4] C08G 18/06, 59/12, 63/08, 63/46
U.S. Cl. 525—123 16 Claims

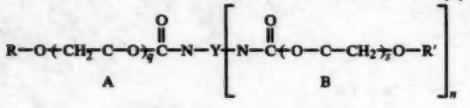
1. A method for improving the flexibility of a phenol or mercapto resin which comprises:

(a) reacting a component containing functionality selected from the group consisting of aliphatic hydroxyl functionality, epoxy functionality, or mixtures thereof, with a capping agent bearing functionality selected from phenol functionality, mercapto functionality, or mixtures thereof, and containing functionality reactive with said component to form a phenolic or mercapto functional adduct; and

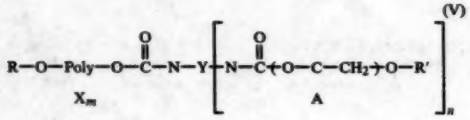
(b) reacting the adduct of the step (a) with a polyisocyanate in the substantial absence of a basic urethane catalyst, said reactants being present in a ratio to produce said resin predominating in one or more of the following general structures:



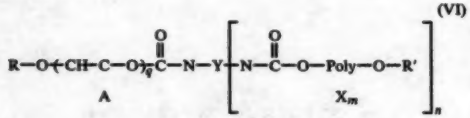
(I)



(II)



(V)



(VI)

where,

R and R′ each is a phenol functional group or a mercapto functional group,

A and B each is an organic chain residue of said component containing epoxy functionality,

Poly and Poly′ each is an organic chain residue of said component containing aliphatic hydroxyl functionality,

X is an aliphatic hydroxyl group,

the wavy line represents an organic chain residue of said polyisocyanate,

n is 1–4,

m and p each is 0–2, and

q and s each is 1–15.

4,803,246

PROCESS FOR THE PREPARATION OF POLYMERS CONTAINING HYDROXYL GROUPS AND THEIR USE FOR THE PRODUCTION OF POLYURETHANES

Manfred Dietrich, Leverkusen; Josef Pedain, Cologne; Klaus König, Leverkusen, and Peter Höhlein, Kempen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

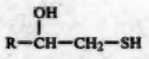
Filed Apr. 9, 1986, Ser. No. 849,649
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515092
Int. Cl.[4] C08L 75/00
U.S. Cl. 525—124 14 Claims

1. A process for the preparation of a polymer containing hydroxyl groups by reacting a copolymer containing carboxyl groups and prepared from

(A) acrylic acid, methacrylic acid or mixtures of acrylic acid and methacrylic acid and

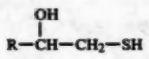
(B) at least one other olefinically unsaturated compound with an alkylene oxide in the presence of a catalyst comprising a member selected from the group consisting of

(a1) an addition product containing two thioether groups and prepared from (i) a mercaptoalkanol corresponding to the formula



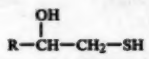
and (ii) a doubly unsaturated terpene hydrocarbon,

(a2) a condensation product with a maximum molecular weight of about 5,000 obtained by the self condensation of an addition product containing two thioether groups and prepared from (i) a mercaptoalkanol corresponding to the formula



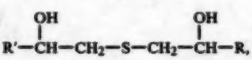
and (ii) a doubly unsaturated terpene hydrocarbon,

(a3) a condensation product with a maximum molecular weight of about 5000 obtained by the condensation of an addition product containing two thioether groups and prepared from (i) a percaptoalkanol corresponding to the formula

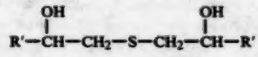


and (ii) a doubly unsaturated terpene hydrocarbon with a positive amount of up to about 50 hydroxyl equivalent %, based on the total number of hydroxyl groups in the condensation reaction mixture, of at least one polyhydric alcohol having a molecular weight of 62 to about 200,

(b1) a relatively high molecular weight thioether having a molecular weight of about 500 to 5000 obtained by the condensation of a thiodiglycol corresponding to the formula



(b2) a relatively high molecular weight thioether having a molecular weight of about 500 to 5000 obtained by the condensation of a thiodiglyol corresponding to the formula



in admixture with a positive amount of up to about 50 hydroxy equivalent %, based on the total number of hydroxyl groups in the condensation reaction mixture, of at least one polyhydric alcohol having a molecular weight of 62 to about 200 and

(c) mixtures of any of the above compounds (a1), (a2), (a3), (b1), and (b2),

wherein

R and R', which may be identical or different, represent hydrogen or a methyl group.

4,803,247

POLYAMIDE COMPOSITIONS HAVING NITRILE RUBBER AND COPOLYMER OF ETHYLENE AND ALPHA-OLEFIN THEREIN

Carl E. Altman, Warren, and Mocherla K. K. Rao, Middlesex, both of N.J., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 27, 1987, Ser. No. 113,933

Int. Cl.[4] C08L 77/00

U.S. Cl. 525—179 **6 Claims**

1. A flexible, chlorofluorohydrocarbon permeation resistant composition comprising: from about 40 to 90 percent by weight of at least one polyamide, from about 5 to 40 percent by weight of at least one nitrile rubber, and from about 5 to 40 percent by weight of at least one reactive rubber comprising a copolymer of ethylene and an α-olefin having 3 to 8 carbons, said copolymer having an unsaturated reactive graft moiety reactive with the end groups of the polyamide.

4,803,248

RUBBER COMPOSITIONS

Hitoshi Kondo, Higashimurayama; Makoto Sasaki, Yokohama, and Yukio Kobayashi, Koto, all of Japan, assignors to Bridgestone Corporation and Nippon Oil Co., Ltd., both of Tokyo, Japan

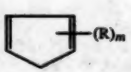
Division of Ser. No. 12,468, Feb. 9, 1987. This application Apr. 25, 1988, Ser. No. 185,677

Int. Cl.[4] C08L 7/00, 9/00

U.S. Cl. 525—211 **3 Claims**

1. A rubber composition which exhibits improved cut resistance and chipping resistance comprising 1 to 30 parts by weight of at least one resin, based upon 100 parts by weight of at least one rubber selected from the group consisting of natural rubber and synthetic diene rubbers, wherein said resin is a cyclopentadiene series hydrocarbon resin (R_3) obtained by copolymerizing:

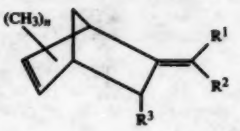
(i) 100 parts by weight of component (A), wherein component (A) is at least one compound selected from a cyclopentadiene ring containing the compound represented by the following formula:



(I)

wherein R_1 is an alkyl group having 1 to 3 carbon atoms and m is an integer of 0 to 6, and its Diels-Alder reaction adduct with,

(ii) 5 to 150 parts by weight of component (D), wherein component (D) is a 5-alkylidenenorbornene-2 or its derivative represented by the following general formula:



(II)

wherein R_1, R_2 and R_3 are hydrogen atom or an alkyl group having 1 to 3 carbon atoms and n is 0 or 1.

4,803,249

DERIVATIVES OF POLYCARBONE SULFIDES

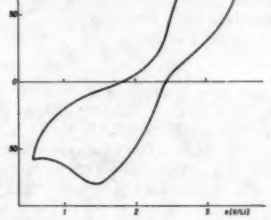
Michel Armand, Echirolles; Mireille Fouletier, and Pierre Degott, both of Grenoble, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Division of Ser. No. 740,919, Jul. 10, 1985, Pat. No. 4,739,018. This application Jul. 25, 1986, Ser. No. 889,195

Claims priority, application France, Sep. 20, 1983, 83 14940; Jun. 28, 1984, 84 10254

Int. Cl.[4] C08F 114/18, 38/02

U.S. Cl. 525—326.2 **10 Claims**



1. A linear sulphuretted carbon compound, comprising a copolymer of the formula (II)

$$[(CH)_p(R_xCS_m)_{1-p}]_n$$

wherein:

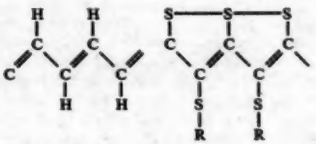
R is independently hydrogen, an alkali metal, silver, zinc, copper or cobalt;

x represents the degree to which R is present in the structure and has a value of between 0 and m/(valency of the metal), these values being inclusive;

m represents the degree of substitution with sulphur and has a value of $0<m\leqq 1$;

$0>p>1$; and

n represents the number of formula (II) units in the copolymer; wherein the copolymer comprises the structural formula (III)



(III)

4,803,250

RUBBER COMPOSITION WITH BISMALEIMIDES

Hideo Nagasaki, Osaka, and Yasuzi Takemoto, Sakai, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 814,881, Dec. 30, 1985, abandoned. This application Mar. 2, 1987, Ser. No. 20,227

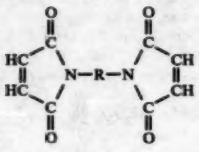
Claims priority, application Japan, Jan. 19, 1985, 60-7888; Jan. 22, 1985, 60-10226

Int. Cl.[4] C08C *19/20*

U.S. Cl. 525—329.3 6 Claims

1. A rubber composition comprising a rubber selected from the group consisting of natural rubber, styrene-butadiene rubber, butadiene rubber, isoprene rubber, acrylonitrile-butadiene rubber, chloroprene rubber, ethylene propylene-diene terpolymer and isoprene-isobutylene rubber, in combination with the following components:

(A) a bismaleimide compound represented by the general formula (I)



(I)

wherein R is a divalent acyclic aliphatic group, cyclic aliphatic group, aromatic group, or alkylaromatic group, and wherein these groups may contain a hetero atom selected from O, N, and S,

(E) an aromatic carboxylic acid anhydride,

(F) sulfur and/or a sulfur donor, and

(G) a vulcanization accelerator.

4,803,251

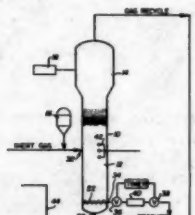
METHOD FOR REDUCING SHEETING DURING POLYMERIZATION OF ALPHA-OLEFINS

Mark G. Goode, St. Albans; Daniel M. Hasenberg; Thomas J. McNeil, both of Hurricane, and Thomas E. Spriggs, Cross Lanes, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 4, 1987, Ser. No. 116,538

Int. Cl.[4] C08F *2/00, 2/34, 2/38*

U.S. Cl. 526—59 12 Claims



1. A method for reducing sheeting during polymerization of alpha-olefins in a low pressure fluidized bed reactor utilizing titanium or vanadium based compounds as catalysts together with alkyl aluminum cocatalysts which comprises determining the electrostatic levels at the site of possible sheet formations in said reactor; if negative electrostatic levels are indicated then adding a positive charge generating chemical additive to the reactor said additive being selected from the group consisting of alcohols containing up to 7 carbon atoms, oxygen and nitric oxide; if positive electrostatic levels are indicated in said reactor then, adding a negative charge generating chemical additive to the reactor said chemical additive being a ketone containing up to 7 carbon atoms, said positive or negative charge generating chemical additive being added to said reactor as required in an amount sufficient to create and maintain neutral static charges in said reactor.

4,803,252

PARTICLES OF CROSSLINKED POLYMER PREPARED BY EMULSION POLYMERIZATION IN THE ABSENCE OF DISPERSION STABILIZER

Katsuaki Kida; Akio Kashihara, both of Osaka; Keizou Ishii, Hyogo, and Hiromichi Kayano, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

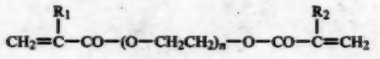
Filed Jul. 29, 1986, Ser. No. 890,483

Claims priority, application Japan, Jul. 29, 1986, 60-168439

Int. Cl.[4] C08F *20/10, 120/10, 220/10*

U.S. Cl. 526—297 2 Claims

1. A method for preparing particles of a crosslinked polymer comprising reacting 0.5 to 50 parts by weight of di (meth) acryloyl bearing compound (A) of the formula



wherein R_1 and R_2 each represents hydrogen or methyl group, and n is an integer of 4 to 30, and 99.5 to 50 parts by weight of at least one other copolymerizable unsaturated monomer (B), in an aqueous medium and in the absence of a dispersion stabilizer, through an emulsion polymerization said copolymerizable unsaturated monomer (b) being selected from the group consisting of a carboxyl group bearing monomer, a hydroxyl group bearing monomer, a nitrogen containing alkyl acrylate or methacrylate, a copolymerizable amide, a polymerizable nitrile, an alkyl acrylate or methacrylate, a polymerizable aromatic compound, an α-olefin, a vinyl compound and a diene compound.

4,803,253

ETHYLENE POLYMER PRODUCED USING A CATALYST COMPRISING A PHOSPHATE AND WITH A BIS-(CYCLOPENTADIENYL)CHROMIUM(II) COMPOUND

Max P. McDaniel, and James N. Short, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 575,631, Jan. 31, 1984, abandoned, which is a division of Ser. No. 423,499, Sep. 24, 1982, Pat. No. 4,690,990, which is a division of Ser. No. 363,681, Mar. 30, 1982, Pat. No. 4,424,139. This application Mar. 29, 1985, Ser. No. 718,047

Int. Cl.[4] C08F *110/02, 4/78*

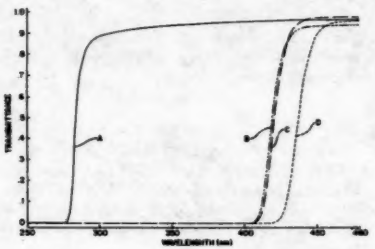
U.S. Cl. 526—352.2 14 Claims

1. An ethylene polymer having 0.3 to 2 mole percent methyl branches and an HLMI/MI ratio of no more than 29 made by polymerizing a monomer system consisting essentially of pure ethyelene which is essentially free of propylene.

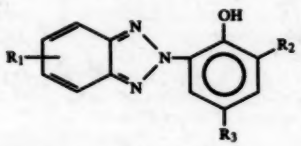
4,803,254
VINYLSILYLALKOXY ARYLBENZOTRIAZOLE COMPOUNDS AND UV ABSORBING COMPOSITIONS MADE THEREFROM

Gary B. Dunks, Upland; Akira Yamada, Claremont; Namasivayn Doddi, Upland, all of Calif., and Charles D. Beard, Montchanin, Del., assignors to Iolab Corporation, Claremont, Calif.

Filed Mar. 11, 1987, Ser. No. 24,638
Int. Cl.[4] C08F 283/12, 30/08
U.S. Cl. 525—477 12 Claims



1. A vinylsilylalkoxy arylbenzotriazole compound of the formula:



I

wherein R_1 and R_3 individually represent hydrogen, halo, alkoxy of up to 6 carbon atoms, or X, wherein R_2 represents hydrogen or alkyl of up to six carbon atoms, and wherein X represents a group of the formula:

$$—O—R'Si(R'')_2CH=CH_2$$

wherein R' represents alkylene of from 1 to 10 carbon atoms, and wherein each R'' individually represents alkyl of up to 4 carbon atoms or aryl, provided that one, and only one, of R_1 or R_3 represents X.

5. An optically clear siloxane polymer having ultraviolet light absorbing properties, said polymer having covalently bonded therein the compound of claim 1.

4,803,255
LIGNIN AND LIGNIN DERIVATIVES AS COPOLYMERIZABLE COLORANTS FOR POLYESTERS

Wayne P. Pruett; John A. Hyatt, both of Kingsport, and Samuel D. Hilbert, Jonesborough, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 22, 1987, Ser. No. 64,646
Int. Cl.[4] C08H 5/02; C08G 63/02
U.S. Cl. 527—400 27 Claims

1. A shapable colored copolymer consisting essentially of a polyester having chemically linked into the polyester backbone color-imparting amounts of a compound selected from the group consisting of lignin and lignin compounds having functional groups chemically linkable into said polyester backbone; wherein said polyester comprises the polymeric reaction product of at least one diol, and at least one compound selected from aliphatic dicarboxylic acids, alicyclic dicarboxylic acids, aromatic dicarboxylic acids, esters of such dicarboxylic acids and anhydrides of such dicarboxylic acids.

13. A process for preparing a copolymer consisting essentially of a polyester having chemically linked into the polyester backbone color-imparting amounts of a compound selected from the group consisting of lignin and lignin compounds having functional groups chemically linkable into said polyester backbone, said process comprising the steps of:

polymerizing at least one diol with at least one compound selected from aliphatic dicarboxylic acids, alicyclic dicarboxylic acid, aromatic dicarboxylic acids, esters of such dicarboxylic acids and anhydrides of such dicarboxylic acids in the presence of a color-imparting amount of a compound selected from lignin and lignin compounds which can be chemically linked into said polyester backbone and recovering the resultant polyester.

4,803,256
METHOD OF ALTERING THE SURFACE OF A SOLID SYNTHETIC POLYMER

Roy Luckenbach, Charlotte, N.C., assignor to Dow Corning Corporation, Midland, Mich.

Filed Feb. 1, 1988, Ser. No. 150,877
Int. Cl.[4] C08G 63/12
U.S. Cl. 525—420 26 Claims

1. A method of altering the surface of a solid synthetic polymer, the method comprising

(I) contacting the polymer with a bath of a swelling agent, or a mixture of swelling agents, and a base, at a pH of seven or greater;

(II) heating the bath to a temperature of at least 200 degrees F. for a time of at least 1 second:

(III) acidifying the bath to a pH of less than 7;

(IV) separating the polymer and the bath, whereby a polymer having an altered surface is obtained.

4,803,257
FLEXIBLE, STRUCTURAL POLYURETHANE ADHESIVES WITH INITIAL PRESSURE SENSITIVE ADHESIVE PERFORMANCE

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 24, 1987, Ser. No. 42,070
Int. Cl.[4] C08G 18/30
U.S. Cl. 528—45 11 Claims

1. A polyurethane structural adhesive having initial pressure sensitive adhesive performance comprising a mixture of a blocked polyisocyanate and a polyamine curing agent wherein the polyisocyanate is a prepolymer obtained by the reaction of a poly (alkylene oxide) polyol with a polyisocyanate and said prepolymer is blocked with a phenolic blocking agent selected from the group consisting of phenol, nonylphenol, cresol, napthol, an alkyl phenol and an alkoxy phenol and the polyamine curing agent is selected from the group consisting of ethylene diamine, propylene diamine, hexamethylene diamine, bis (aminomethyl) cyclohexane, dimer acid diamine, diethylene triamine, dipropylene triamine, triethylene tetramine, bis (aminopropyl) piperazine, poly (alkylene oxide) diamines and poly (alkylene oxide) triamines.

4,803,258

THERMOPLASTIC AROMATIC POLYETHER-PYRIDINE AND PROCESS FOR PREPARING SAME

Keizaburo Yamaguchi, Kawasaki; Hideaki Oikawa, Yokohama; Kenichi Sugimoto, Yokohama; Masahiro Ohta, Yokohama, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

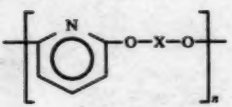
Filed Jul. 23, 1987, Ser. No. 76,873

Claims priority, application Japan, Aug. 1, 1986, 61-180180; Nov. 6, 1986, 61-262856

Int. Cl.[4] C08G 65/40

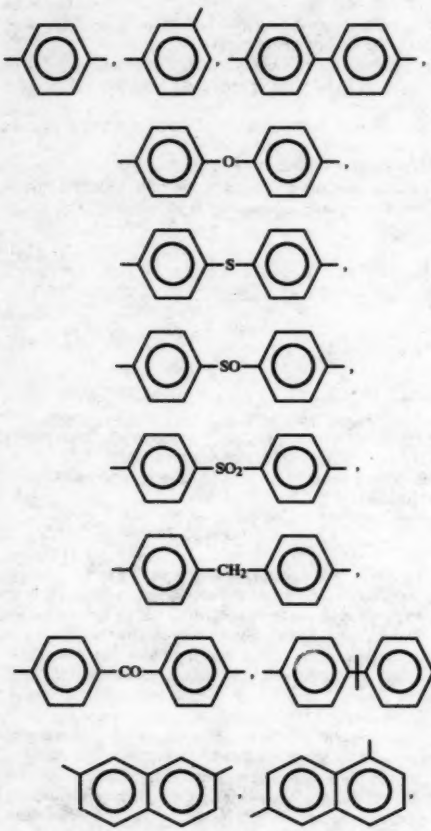
U.S. Cl. 528—211 **5 Claims**

1. A thermoplastic aromatic polyether-pyridine composed of repeating structural units of the general formula



(I)

where X is a divalent radical selected from the group consisting of



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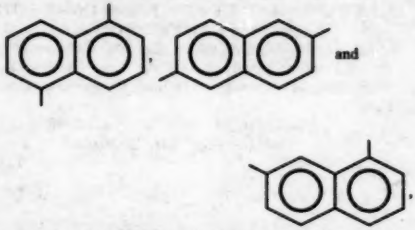


one or two of such divalent radicals are present in the molecule, and n represents a degree of polymerization and is a whole number of 10 or greater.

4,803,259

ISOPROPANOLAMINES AS CATALYST DEACTIVATORS IN SOLUTION PROCESS FOR POLYMERIZATION OF ALPHA-OLEFINS

Vaclav G. Zboril, and David J. Mitchell, both of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Apr. 22, 1987, Ser. No. 41,248

Claims priority, application United Kingdom, Apr. 25, 1986, 8610126

Int. Cl.[4] C08F 6/02, 6/10

U.S. Cl. 528—483 **11 Claims**

1. A solution polymerization process for the preparation of high molecular weight polymers of alpha-olefins selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and C_3–C_{12} hydrocarbon alpha-olefins, said process comprising feeding monomer selected from the group consisting of ethylene and mixtures of ethylene and at least one C_3–C_{12} hydrocarbon alpha-olefin, a coordination catalyst and inert hydrocarbon solvent to a reactor, said catalyst being a titanium-based and/or vanadium-based coordination catalyst containing halogen and/or alkyl radicals, polymerizing said monomer at a temperature of 105° to 320° C. and a pressure of less than 25 MPa, deactivating the catalyst by admixing the solution passing from the reactor with at least one trialkanolamine deactivating agent of the formula $N(ROH)(R'OH)_2$, where R is isopropyl and R' is alkyl of 2–4 carbon atoms, without taking steps to physically separate the deactivated catalyst from the solution, separating the hydrocarbon solvent and other volatile matter from the resultant solution, and recovering a composition of said high molecular weight polymer, the amount of deactivating agent being not more than 2.5 moles of deactivating agent per mole of halogen plus alkyl radicals in the coordination catalyst.

4,803,260

RECOVERY OF VINYL CHLORIDE RESIN WITH AID OF SCREEN

Masaaki Nishina, Takaoka, and Junsei Kawahuti, Kamakura, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,573

Claims priority, application Japan, Jan. 31, 1985, 60-17429

Int. Cl.[4] C08F 6/24, 6/14

U.S. Cl. 528—487 **9 Claims**

1. A method for recovering vinyl chloride resin selected from the group consisting of vinyl chloride homopolymer and vinyl chloride copolymers composed of at least 70% by weight of vinyl chloride and up to 30% by weight of at least one olefinic monomer copolymerizable with vinyl chloride, said homopolymer or copolymer being prepared by emulsion polymerization, fine suspension polymerization or suspension polymerization, from an aqueous dispersion thereof, said aqueous

dispersion having a vinyl resin content of from 10 to 70% by weight, which comprises

(a) passing the aqueous dispersion of the vinyl chloride resin through a screen of 20 to 150 micron mesh;

(b) mixing the aqueous dispersion which has passed through said screen with an organic liquid which is difficultly soluble in water and does not dissolve or swell vinyl chloride resin, said mixing causing aggregation of the dispersed vinyl chloride resin;

(c) separating and removing the aqueous phase from the liquid mixture containing the resin aggregate obtained in step (b); and

(d) dehydrating and drying the resin aggregate from which the aqueous phase has been separated in step (c).

4,803,261

METHOD FOR SYNTHESIZING A PEPTIDE CONTAINING A NON-PEPTIDE

David H. Coy, and Simon J. Hocart, both of New Orleans, La., assignors to The Administrators of the Tulane Educational Fund, New Orleans, La.

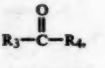
Filed Jun. 27, 1986, Ser. No. 879,348

Int. Cl.[4] A61K *37/02*

U.S. Cl. 530—333 **6 Claims**

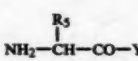
1. A method of solid-phase chemical modification of a peptide, comprising the steps of

(a) providing a carbonyl-containing compound of the formula



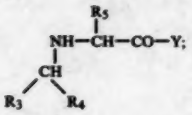
where R_3 and R_4, independently, comprise hydrogen, branched or straight chain lower alkyl group, or aryl group;

(b) providing a complex of the formula



where Y comprises a solid phase and R_5 is a side group of an amino acid; and

(c) reacting said carbonyl-containing compound with said complex in the presence of sodium cyanoborohydride to form



4,803,262

HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO HUMAN CYTOTOXIC AND SUPPRESSOR T CELLS, ANTIBODY, AND METHODS

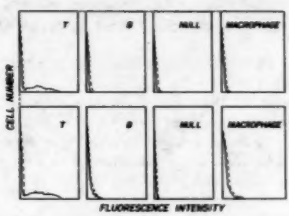
Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation of Ser. No. 643,593, Aug. 23, 1984, abandoned, which is a division of Ser. No. 432,455, Oct. 4, 1982, Pat. No. 4,637,983, which is a division of Ser. No. 82,515, Oct. 9, 1979, Pat. No. 4,364,932. This application Nov. 26, 1986, Ser. No. 935,167

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.[4] A61K *39/395*; **C07K** *15/02*

U.S. Cl. 530—387 **4 Claims**



1. Mouse monoclonal antibody that reacts with a same antigen as the monoclonal antibody produced by the hybridoma ATCC CRL 8013 or CRL 8016.

4,803,263

PROCESS FOR THE PREPARATION OF ALKYLATED GLYCOSYL FLUORIDES FREE FROM HYDROXYL GROUPS

Joachim Thiem, Münster; Hans-Matthias Deger, Hofheim am Taunus; Wolfram Fritsche-Lang, Bensheim, and Matthias Kreuzer, Münster, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 7, 1986, Ser. No. 894,197

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528654

Int. Cl.[4] C07H *15/00, 19/00, 21/00*

U.S. Cl. 536—18.6 **16 Claims**

1. A process for the preparation of alkylated glycosyl fluorides free from hydroxyl groups, which comprises alkylating glycosyl fluorides which contain hydroxyl groups with alkylating agents capable of producing an ether linkage between a saturated aliphatic hydrocarbon atom and oxygen, in the presence of a basic system of at least one compound selected from

the group consisting of an oxide of the first group of the periodic table, a hydroxide of the first group of the periodic table,

an alkali metal alcoholate in which the alcohol component has up to 6 carbon atoms, and an alkali metal hydride.

4,803,264

PROCESS FOR THE PREPARATION OF A POLYSACCHARIDE IN OIL DISPERSION AND DISPERSION OBTAINED THEREBY

Wilhelmus J. Krijnen; Jacob B. Roest, and Jacob Bloemheuvel, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 25, 1986, Ser. No. 934,981

Claims priority, application United Kingdom, Dec. 9, 1985, 8530271

Int. Cl.[4] C09K *7/06;* **C08J** *3/02;* **E21B** *43/25*

U.S. Cl. 536—114 **9 Claims**

1. A process for the preparation of a polysaccharide in oil dispersion which comprises the steps of

(a) forming a water-in-oil emulsion by dispersing in oil an aqueous solution of polysaccharide, in the presence of at least one dispersion promoter,

(b) drying the resulting emulsion azeotropically, and

(c) physically isolating from the resulting azeotropically dried residue an oil phase containing oil and dispersion promotor and a polysaccharide in oil dispersion in the form of a suspension phase containing polysaccharide, dispersion promoter and oil.

4,803,265

METHOD FOR CARRYING OUT THE ORGANIC SYNTHESIS OF OLIGOSACCHARIDES CONTAINING GALACTOSAMINE-URONIC ACID PATTERNS, NOW OLIGOSACCHARIDES OBTAINED AND BIOLOGICAL APPLICATIONS THEREOF

Jean-Claude Jacquinet, Orleans-La Source; Maurice Petitou, Paris; Pierre Sinay, Orleans, and Jean Choay, Paris, all of France, assignors to Choay, S.A., Paris, France

Continuation of Ser. No. 624,628, Jun. 26, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 856,855

Claims priority, application France, Oct. 27, 1982, 82 18003

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/70;* **C07H** *5/06*

U.S. Cl. 536—123 **53 Claims**

1. A process for synthesizing an acid mucopolysaccharide condensation product having from 2–12 saccharides which process comprises condensing a first saccharide with a second saccharide to form a condensation product having a 1–4 beta linkage between the first saccharide and the second saccharide,

wherein the first saccharide is selected from the group consisting of a protected D-galactosamine unit and an oligosaccharide comprised of alternating protected D-galactosamine and protected uronic acid units linked in the manner found in chondroitin sulfate and dermatan sulfate and having a terminal D-galactosamine at the reducing end, and

wherein the second saccharide is selected from the group consisting of a uronic acid unit and an oligosaccharide comprised of alternating protected D-galactosamine and protected uronic acid units linked in the manner found in chondroitin sulfate and dermatan sulfate and having a terminal uronic acid at the nonreducing end, further

wherein any uronic acid unit is selected from the group consisting of D-glucuronic acid and L-iduronic acid and further

wherein any D-galactosamine units have nitrogen containing groups at carbon 2, which nitrogen containing groups can be treated to form an amine.

4,803,266

3-OXOALKYLIDENE-2-AZETIDINONE DERIVATIVES

Yutaka Kawashima, Tatebayashi; Masakazu Satoh, Konosu; Yuichi Hatada, Tokyo; Fumiko Hazato; Yoshimoto Nakashima, both of Ageo, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

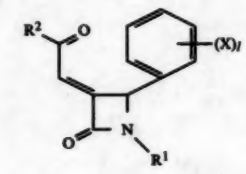
Filed Oct. 5, 1987, Ser. No. 104,152

Claims priority, application Japan, Oct. 17, 1986, 61-246638

Int. Cl.[4] C07D *205/08, 205/10, 405/04;* **A61K** *31/395*

U.S. Cl. 540—200 **1 Claim**

1. 2-Azetidinone derivatives represented by the following formula:

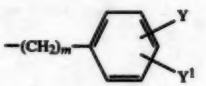


wherein:

X is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl or cyano,

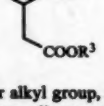
l is 1 or 2,

R^1 is lower alkyl, cycloalkyl, 1-naphthylmethyl, 1-phenethyl, 1-carboxy-2-phenethyl, a member of a group of the formula



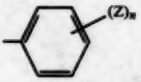
wherein Y and Y' are the same or different and each is hydrogen, halogen, lower alkyl, lower alkoxy, dimethylamino, carboxyl, dichloroacetyl or trifluoromethyl, or Y and Y' together form methylenedioxy, and m is 0 or 1 or

R^1 is a member of a group of the formula



wherein R^3 is lower alkyl group, and

R^2 is lower alkyl, lower alkoxy, amino, adamantyl, lower alkoxycarbonylmethyl, or a member of a group of the formula



wherein Z is hydrogen, halogen, lower alkyl, lower alkoxy, phenyl or nitro, and n is 1 or 2.

4,803,267

PROCESS FOR PREPARING CEPHALOSPORIN COMPOUNDS

Gordon C. D. Smith, Wokingham, England, assignor to Glaxo Group Limited, London, England

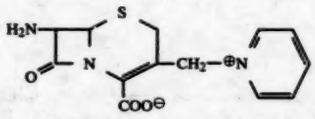
Division of Ser. No. 399,328, Jul. 19, 1982, Pat. No. 4,563,523. This application Aug. 30, 1985, Ser. No. 771,009

Claims priority, application United Kingdom, Jul. 17, 1981, 8122147

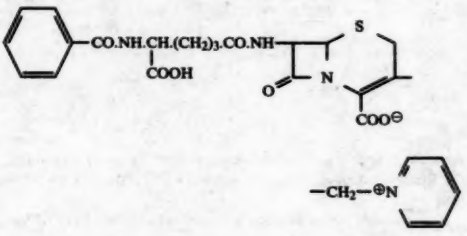
Int. Cl.[4] C07D *501/18*

U.S. Cl. 540—224 **3 Claims**

1. A process for the preparation of a 7-amino-cephalosporin compound of formula



or a salt thereof, which comprises removing the 7-side chain from a compound of the formula



or a salt thereof to form said 7-amino-cephalosporin compound in high yield and purity.

4,803,268

PROCESS FOR THE PREPARATION OF CYCLOHEXANEDIONECARBOXYLIC ACID DERIVATIVES

Hans-Georg Brunner, Lausen, and Urs Müller, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

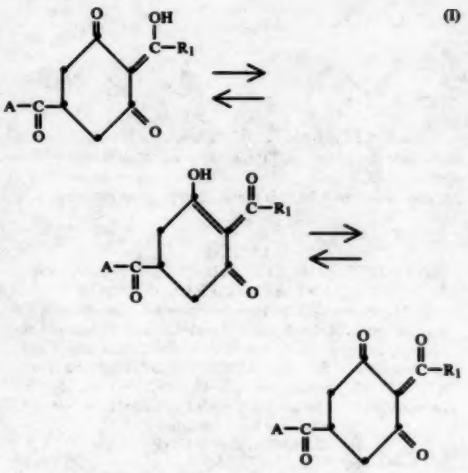
Continuation of Ser. No. 778,109, Sep. 20, 1985, abandoned. This application Jan. 29, 1987, Ser. No. 8,445

Claims priority, application Switzerland, Oct. 2, 1984, 4734/84

Int. Cl.[4] C07D *279/10*; C07C *67/22*

U.S. Cl. 544—58.4 **9 Claims**

1. A process for the preparation of a 4-acyl-3,5-cyclohexanedione-1-carboxylic acid derivative of formula I



(I)

wherein

A is an OR_2 or $-NR_3R_4$ radical or a metal or ammonium salt thereof,

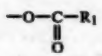
R_1 is C_1–C_6alkyl or C_3–C_6cycloalkyl, each unsubstituted or substituted by halogen, C_1–C_4alkoxy or C_1–C_4alkylthio,

R_2, R_3 and R_4 are each independently hydrogen, C_1–C_6alkyl, C_1–C_4haloalky, C_2–C_{10}alkoxyalkyl, C_2–C_{10}alkylthioalkyl; C_3–C_6alkenyl which is unsubstituted or substituted by halogen, C_1–C_4alkoxy or C_1–C_4alkylthio; C_3–C_6alkynyl; or phenyl wherein the phenyl nucleus is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkyl, nitro or cyano, and

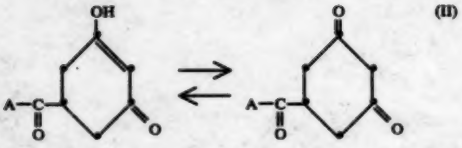
R_3 and R_4, together with the nitrogen atom to which they are attached, also form a 5- or 6-membered heterocyclic ring system which may contain an additional oxygen or sulfur atom in the ring, which process comprises combining, in an inert solvent, a reactive carboxylic acid derivative of formula III

(III)

wherein X is a halogen atom, an alkylsulfonic or arylsulfonic acid radical or the molecular radical



which is necessary to form an anhydride and R_1 is as defined for formula I, and a metal cyanide, heating the reaction mixture to boiling point and, after cooling to a temperature in the range from 0° C. to room temperature, adding in succession to said mixture a Lewis acid, an equimolar amount, with respect to the carboxylic acid derivative of formula III, of a 3,5-cyclohexanedione-1-carboxylic acid derivative of formula II



(II)

wherein A is as defined for formula I, and, gradually, an organic base and, after acidifying the reaction mixture with an aqueous acid, isolating therefrom by extraction the 4-acyl-3,5-cyclohexanedione-1-carboxylic acid derivative of formula I.

4,803,269

4-MONOSUBSTITUTED AND 4,6-DISUBSTITUTED N-(α-PHENYLETHYL)PHENOXAZINES

Joseph M. Muchowski, Sunnyvale; Robert J. Greenhouse, Cupertino, both of Calif., and Angel Guzman, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

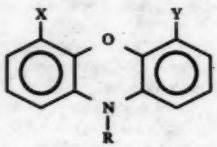
Continuation of Ser. No. 868,976, May 30, 1986, Pat. No. 4,707,473. This application Aug. 14, 1987, Ser. No. 85,595

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[4] C07D *279/24;* C07F *7/10*

U.S. Cl. 544—69 **21 Claims**

1. A compound represented by the formula:



where:

R is an α-phenylethyl protecting group;

X is alkyl, hydroxyalkyl, alkylthio, haloalkyl, $C(O)R^1$, $CH_2NR^2R^3$, or $Si(R^4)_2R^5$; where:

R^1 is hydrogen, hydroxy, alkyl, alkoxy, aryl, aryloxy, or amino;

R^2 and R^3 are independently hydrogen or alkyl, or NR^2R^3 together represent a heterocyclic ring having from four to seven members and containing no more than one hetero-atom additional to the nitrogen of NR^2R^3;

R^4 is lower alkyl or phenyl; and

R^5 is lower alkyl;

Y is the same as X or hydrogen; or a pharmaceutically acceptable salt thereof.

20. A method of preparing a 4-monosubstituted or 4,6-disubstituted phenoxazine, wherein said method comprises removing a N-α-phenylethyl protecting group from the corresponding N-α-phenylethyl-protected compound.

4,803,270

PROCESS OF PRODUCING FLUOROANILINE DERIVATIVES

Ichiki Takemoto, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

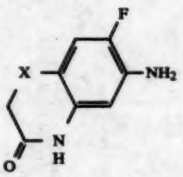
Filed Mar. 9, 1987, Ser. No. 23,387

Claims priority, application Japan, Mar. 10, 1986, 61-52300; Mar. 12, 1986, 61-53921; Nov. 14, 1986, 61-272570; Nov. 14, 1986, 61-272571

Int. Cl.[4] C07D *241/44, 265/36*

U.S. Cl. 544—105 **37 Claims**

1. A process for producing a fluoroaniline derivative of the formula:

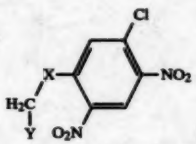


(I)

wherein X is an oxygen atom or an imino group, which comprises (a) reacting 1,5-dichloro-2,4-dinitrobenzene with a glycol derivative of the formula:

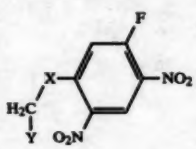
$$Y—CH_2—XH \qquad \text{(II)}$$

wherein X is as defined above and Y is a cyano group, a carboxy group or a lower alkoxycarbonyl group to produce a chlorodinitrobenzene derivative of the formula:



(III)

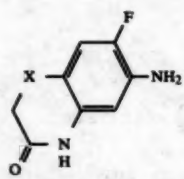
wherein X and Y are each as defined above, (b) reacting the chlorodinitrobenzene derivative (III) with a metal fluoride to produce a fluorodinitrobenzene derivative of the formula:



(IV)

wherein X and Y are each as defined above and (c) subjecting the fluorodinitrobenzene derivative (IV) to reductive cyclization.

2. A process for producing a fluoroaniline derivative of the formula:

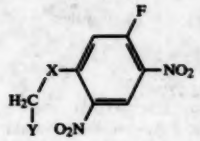


(I)

wherein X is an oxygen atom or an imino group, which comprises (a) reacting 1,5-difluoro-2,4-dinitrobenzene with a glycol derivative of the formula:

$$Y—CH_2—XH$$

wherein X is as defined above and Y is a cyano group, a carboxy group or a lower alkoxycarbonyl group to produce a fluorodinitrobenzene derivative of the formula:



wherein X and Y are each as defined above and (b) subjecting the fluorodinitrobenzene derivative to reductive cyclization.

4,803,271

PROCESS FOR PREPARING GUANINE DERIVATIVES

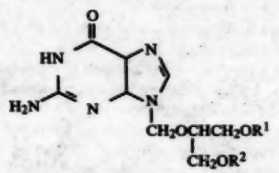
Julien P. H. Verheyden, Los Altos, and John C. Martin, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 26,815, Mar. 17, 1987, which is a continuation of Ser. No. 744,582, Jun. 13, 1985, Pat. No. 4,612,314, which is a continuation of Ser. No. 451,262, Dec. 22, 1982, which is a continuation-in-part of Ser. No. 344,703, Feb. 1, 1982, abandoned. This application Jun. 8, 1987, Ser. No. 59,290

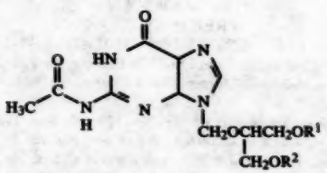
Int. Cl.[4] C07D 473/02; A61K 31/52

U.S. Cl. 544—276 3 Claims

1. A process for preparing the compound of the formula



wherein R^1 and R^2 are the same and are —C(O)R^7 wherein R^7 is 1-adamantyl, which comprises contacting a compound of the formula



with an alcoholic solution of a base.

4,803,272

S-MODIFIED ADENOSYL-1,8-DIAMINO-3-THIOOCTANE DERIVATIVES

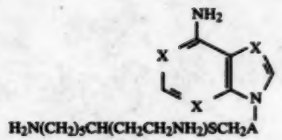
David L. Anton; Bruce D. Korant, and Chia-Lin J. Wang, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1987, Ser. No. 17,889

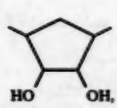
Int. Cl.[4] A61K 31/52; C07D 473/34

U.S. Cl. 544—277 4 Claims

1. A compound of formula (I)



wherein X is N, and A is selected from the group consisting of —CH_2OCH_2—, —$CH_2CHOHCHOHCH_2$—, and



and salts thereof.

4,803,273

2-QUINOXALINYLOXY PHENOXY COMPOUNDS

Alexander Serban, Doncaster; Keith G. Watson, Box Hill North, and Grame J. Farquharson, Reservoir, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

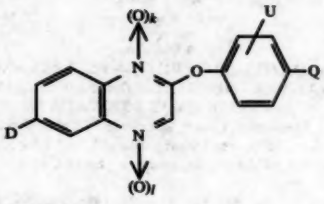
Division of Ser. No. 334,384, Dec. 24, 1981, Pat. No. 4,655,819, which is a continuation-in-part of Ser. No. 164,933, Jul. 1, 1980, abandoned. This application Dec. 9, 1986, Ser. No. 939,694

Claims priority, application Australia, Jul. 17, 1979, PD9617; Apr. 11, 1980, PE3093; Jan. 12, 1981, PE7201

Int. Cl.[4] A01N 43/06; C07D 241/52, 241/44

U.S. Cl. 544—354 1 Claim

1. A compound of formula VIII



wherein

D is chosen from the group consisting of fluorine and chlorine and U is fluorine substituted in the 2-position of the benzene ring;

k and l are independently chosen from 0 and 1; and

Q is chosen from hydroxy and C_1 to C_6 alkoxy.

4,803,274

NORFLOXACIN INTERMEDIATE

István Hermecz; Géza Kereszturi; Lelle Vasvári; Ágnes Horváth, all of Budapest; Mária Balogh, Dunakeszi; Gábor Kovács, Budapest, all of Hungary; Zoltán Mészáros, deceased, late of Budapest, Hungary (by Márta Mészáros, Márta Mészáros née Böröni, heiresses); Péter Ritli, Budapest, Hungary; Judit Sipos, Budapest, Hungary, and Anikó Pájor, Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

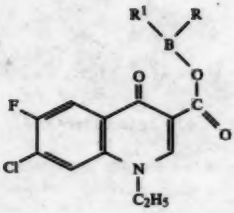
Filed Aug. 7, 1987, Ser. No. 105,298

Claims priority, application Hungary, Dec. 9, 1985, 4693/85

Int. Cl.[4] C07F 5/02; C07D 215/56

U.S. Cl. 546—13 2 Claims

1. A compound of the Formula (I)



(I)

wherein R and R^1 are each C_2 and C_5 alkanoyloxy or benzoyloxy.

4,803,275

2-OXO-5-METHYL-6-[4-HEPTENE]-2H-PYRANO[3,2-C]PYRIDINE

Tsuneo Kanamaru; Susumu Shinagawa, and Masayuki Muroi, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Japan

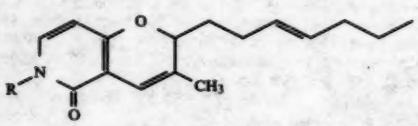
Filed Sep. 2, 1987, Ser. No. 92,310

Claims priority, application Japan, Sep. 11, 1986, 61-215074

Int. Cl.[4] C07D *471/02*

U.S. Cl. 546—116 **8 Claims**

1. A compound of the formula:



wherein R is hydrogen or lower alkyl and 3,4- and 3',4'-double bonds may be saturated with hydrogens.

4,803,276

1-(IMIDAZO[1,2-A]PYRIDIN-6-YL)-2-ALKANONE DERIVATIVES AND (IMIDAZO[1,2-A]PYRIDIN-6-YL) ACETALDEHYDE DERIVATIVES

Motosuke Yamanaka, Chiba; Kazutoshi Miyake, Ibaraki; Shinji Suda, Ibaraki; Hideto Ohhara, Ibaraki, and Toshiaki Ogawa, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

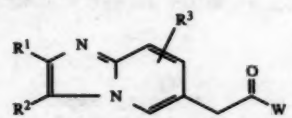
Division of Ser. No. 844,013, Mar. 26, 1986, Pat. No. 4,751,227. This application Oct. 9, 1987, Ser. No. 107,473

Claims priority, application Japan, Mar. 26, 1985, 60-59450

Int. Cl.[4] C07D *471/04*

U.S. Cl. 546—121 **1 Claim**

1. A compound represented by the formula:



R^1 represents a hydrogen atom, a lower alkyl group, phenyl group or a group shown by formula: $—CH_2R^4$ in which R^4 is a lower alkoxy group or a group shown by formula:

in which R^5 and R^6 are hydrogen atom or a lower alkyl group; R^2 represents hydrogen atom or a halogen atom; and R^3 represents hydrogen atom, a lower alkyl group or a halogen atom; and

W represents hydrogen or a lower alkyl group.

4,803,277

NOVEL HETEROCYCLIC COMPOUNDS

Kozo Shiokawa, Kawasaki; Shinichi Tsuboi; Shoko Sasaki, both of Hino; Koichi Moriya, Tokyo; Yumi Hattori, and Katsuhiko Shibuya, Hachioji, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

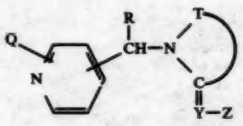
Filed Aug. 24, 1987, Ser. No. 88,932

Claims priority, application Japan, Sep. 10, 1986, 61-211753

Int. Cl.[4] C07D *401/06*; A61K *31/44*

U.S. Cl. 514—332 **11 Claims**

1. A heterocyclic compound of the formula



wherein

Q is at least one substituent selected from halogen atoms, C_1–C_4 alkyl groups optionally substituted by halogen, C_1–C_4 alkoxy groups optionally substituted by halogen, C_2–C_4 alkenyl groups optionally substituted by halogen, C_1–C_4 alkylsulfinyl groups, C_1–C_4 alkylsulfonyl groups and C_3–C_4 alkynyl groups,

R represents a hydrogen atom or a methyl group,

Y represents =N— or =CH—,

Z represents a nitro group or a cyano group, and

T represents 4 ring members of a 6-membered unsaturated heterocyclic ring which it forms together with the adjoining carbon atom and nitrogen atom, said 6-membered unsaturated heterocyclic ring optionally containing an additional ring nitrogen atom and optionally substituted by at least one of halogen atoms and C_1–C_4 alkyl groups optionally substituted by halogen.

4,803,278

PREPARATION OF 1,3-DIHYDRO-4-PYRIDOYL-2H-IMIDAZOL-2-ONES

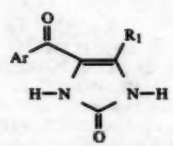
Richard A. Schnettler, and Chi-Hsin R. King, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 820,280, Jan. 17, 1986, abandoned, which is a continuation of Ser. No. 754,191, Jul. 10, 1985, abandoned, which is a continuation of Ser. No. 635,852, Jul. 30, 1984, abandoned. This application Oct. 7, 1986, Ser. No. 916,131

Int. Cl.[4] C07D *401/02*

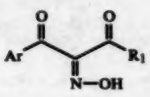
U.S. Cl. 546—278 **5 Claims**

4. A process for the preparation of a pyridoylimidazol-2-one of the formula

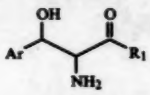


wherein Ar is a 2-, 3- or 4-pyridyl group and R_1 is a hydrogen or a 1 to 4 carbon atom alkyl group which comprises:

(a) reducing a diketo-oxime of the general formula

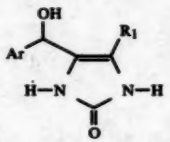


wherein Ar and R_1 are as defined above with hydrogen gas and a metallic catalyst or a dissolving metal to produce an hydroxyiminoketone of the formula



wherein Ar and R_1 are as defined above;

(b) cyclizing the thus produced hydroxyiminoketone by reaction with a cyanate ion to produce an hydroxymethylimidazol-2-one of the general formula



wherein Ar and R_1 are as defined above; and

(c) oxidizing the thus produced hydroxymethylimidazol-2-one with an N-haloimide to produce the desired pyridoylimidazol-2-one and isolating the product.

4,803,279

1,4-DIHYDRO-4-PYRIDYL-SUBSTITUTED IMIDAZO (2,1-b) THIAZOLES AND THE CORRESPONDING THIAZINES.

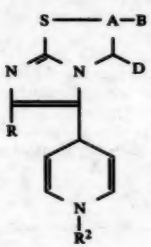
Paul E. Bender, Cherry Hill; Ivan Lantos, Blackwood, both of N.J.; Michael A. McGuire, Norristown, Pa.; Lendon N. Pridgen, Audubon, Pa., and Herbert B. Winicov, Blue Bell, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 737,137, May 29, 1985, abandoned, and a continuation-in-part of Ser. No. 808,595, Dec. 12, 1985, abandoned. This application Apr. 28, 1986, Ser. No. 856,246

Int. Cl.[4] C07D *513/04*

U.S. Cl. 546—271 **7 Claims**

1. A compound of the formula



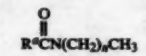
in which

A is —C—, —CH—, —CCH_2—, —CH_2C—, —$CHCH_2$— or —CH_2CH—; B and D are independently H, methyl, ethyl, or gem-dimethyl;

R is

(a) phenyl;

(b) monosubstituted phenyl wherein the substituent is halogen, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_4 alkyl, CF_3, 2,2,2-trihaloethoxy, prop-ene-1-oxy, C_1–C_3 dialkylamino,

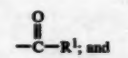


wherein R^a is H, CH_3, CH_2CH_3 and n is 0 to 2, pyrrolidino, or piperidino;

(c) disubstituted phenyl wherein the substituents are independently C_1–C_4 alkyl or C_1–C_3 alkoxy, or the substituents together form a methylene-dioxy group; or

(d) 3,4,5-trimethoxyphenyl;

R^2 is H or



; and

R^1 is C_1–C_8 alkyl, C_1–C_8 alkoxy, phenyl, phenoxy, benzyl, or benzyloxy.

4,803,280

SUBSTITUTED 1,2,3-THIA-DIAZOLE-4-THIOLATES

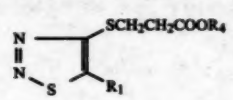
Ving J. Lee, Monsey, and William V. Curran, Pearl River, both of N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Filed Jul. 8, 1986, Ser. No. 883,189

Int. Cl.[4] C07D *285/06*

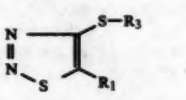
U.S. Cl. 548—127 **11 Claims**

1. A compound having the formula:



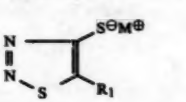
wherein R_1 is selected from the group consisting of hydrogen; alkyl(C_1–C_6); (multisubstituted)phenyl wherein the substituents are selected from alkyl(C_1–C_6), alkoxy(C_1–C_3), chloro, fluoro and trifluoromethyl; naphthyl; thienyl; phenylthio; tetrahydropyranyl; benzyl; and —$COOC_2H_5$; and R_4 is alkyl(-C_1–(C_3).

2. A compound having the formula:



wherein R_1 from the group consisting of hydrogen; alkyl(-C_1–C_6); polyfluorinated alkyls (C_1–C_6); phenyl; (multisubstituted)phenyl wherein the substituents are selected from alkyl (C_1–C_6), alkoxy(C_1–C_3), chloro, fluoro and trifluoromethyl; naphthyl; thienyl; phenylthio; tetrahydropyranyl; benzyl; and —$COOC_2H_5$; and R_3 is selected from the group consisting of alkyl(C_1–C_3); phenyl; alkenyl(CC_3–C_6) —$CH_2COOC_2H_5$; —$C(CH_3)_2COOC_2H_5$ and —CH_2CH_2CN.

3. A compound having the formula:



wherein Rl is selected from the group consisting of hydrogen; alkyl(C_1–C_6); polyfluorinated alkyls(C_1–C_6); phenyl; (multisubstituted)phenyl wherein the substituents are selected from alkyl(C_1–C_6), alkoxy(C_1–C_3), chloro, fluoro and trifluoro-

methyl; naphthyl; thienyl; phenylthio; tetrahydropyranyl: benzyl; and —$COOC_2H_5$: and M is sodium or potassium.

4,803,281

PREPARATION OF 4-METHYLIMIDAZOLE

Walter Mesch, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 129,711

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3642484

Int. Cl.[4] C07D *233/58*

U.S. Cl. 548—335 **10 Claims**

1. A process for the preparation of 4-methylimidazole which comprises:

reacting hydroxypropanone and formamide in the presence of an addition to the reaction mixture of at least twice the molar amount of ammonia, based on the amount of hydroxypropanone, the reaction being carried out in the liquid phase at temperatures of from 100° to 200° C. and pressures of from 10 to 250 bar.

4,803,282

ALPHA-SUBSTITUTED KETONITRONE DERIVATIVES

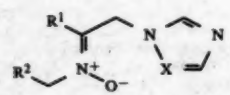
Vassil St. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 27, 1986, Ser. No. 900,856

Int. Cl.[4] C07D *409/06, 405/06, 233/61*

U.S. Cl. 548—336 **18 Claims**

1. A compound of the formula:



wherein;

R^1 is selected from 2-naphthyl, 2-furanyl, 2-thienyl, phenyl, and substituted phenyl having one or more of the meta and para hydrogens substituted by halogen, lower alkyl, lower alkoxy, or combinations thereof,

R^2 is selected from hydrogen and phenyl, and

X is a methyn group.

4,803,283

PREPARATION OF 4(5)-NITROIMIDAZOLE-5(4)-CARBOXYLIC ACIDS

Toni Dockner, Meckenheim; Uwe Kempe, Dannstadt-Schauernheim, and Hermann Koehler, Beindersheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,867

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641514

Int. Cl.[4] C07D *233/91*

U.S. Cl. 548—339 **14 Claims**

1. A process for the preparation of a 4(5)-nitroimidazole-5(4)-carboxylic acid, which comprises reacting an imidazole-4(5)-carboxylic acid with a mixture of sulfuric acid and nitric acid at not less than 80° C., the water content of the reaction mixture at the beginning of the reaction being no more than 5% by weight, based on the reaction mixture.

4,803,284

PROCESSES FOR THE PREPARATION OF 3-AMINO-2-(5-METHOXY-1H-INDOL-3-YL) PROPIONIC ACID MONOHYDRATE

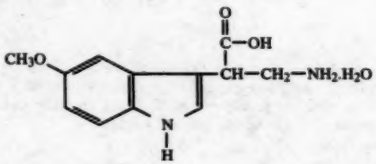
Pedro Joseph-Nathan, and Martha S. Morales-Rios, both of Mexico City, Mexico, assignors to Centro de Investigacion y de Estudios Avanzados Del Instituto Politecnico Nacional, Mexico City, Mexico

Filed Aug. 19, 1987, Ser. No. 87,040

Int. Cl.[4] C07D *209/20*

U.S. Cl. 548—497 **10 Claims**

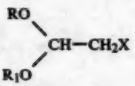
1. A process for preparing a therapeutically useful compound having Formula I



I

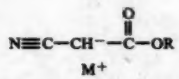
comprising the steps of:

(a) reacting a compound having Formula II



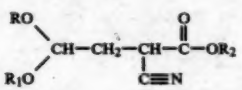
II

where R is a methyl group or an ethyl group, R_1 is a methyl group or an ethyl group, and X is chlorine, bromine or iodine with a compound having Formula III



III

where R is a methyl group or an ethyl group, and M^+ is an alkali metal cation, in a suitable solvent at temperatures in the range of from about 40° C. to 130° C. to provide a compound having Formula IV

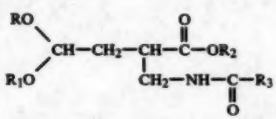


IV

where R is a methyl group or an ethyl group, R_1 is a methyl group or an ethyl group, and R_2 is a methyl group or an ethyl group;

(b) separating Compound IV from the reaction mass;

(c) hydrogenating the compound having Formula IV under pressure, in the presence of a catalyst in a suitable solvent selected from the group of acetyl chloride, propionyl chloride, benzoyl chloride, acetic anhydride or propionic anhydride to produce a compound having Formula V



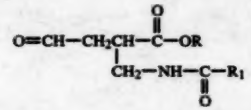
V

where R, R_1 and R_2 are as defined for Compound IV, and R_3 is a methyl group, an ethyl group or phenyl group;

(d) separating Compound V from the reaction mass;

(e) hydrolyzing the compound having Formula V in a suit-

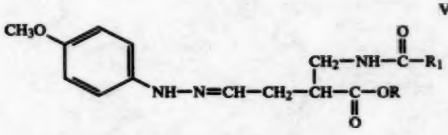
able solvent with an aqueous acid solution at concentrations of about 0.1N to 10N for about 1 to 60 minutes at temperatures of from about 20° C. to 100° C. to provide a compound having Formula VI



VI

where R is a methyl group or an ethyl group and R_1 is a methyl group, an ethyl group or a phenyl group;

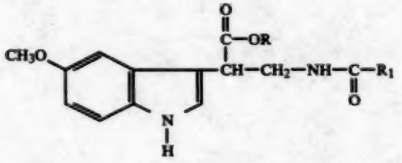
(f) reacting the compound having Formula VI with para-methoxyphenylhydrazine or para-methoxyphenyl hydrazine salts in a suitable solvent with an aqueous acid solution at concentrations of about 0.1N to 10N for about 5 to 100 minutes at temperatures of from about 20° C. to 100° C. to provide a compound having Formula VII



VII

where R and R_1 are as defined for Compound VI;

(g) reacting the compound having Formula VII in a suitable solvent with an acid in aqueous solution at concentrations of about 1N to 10N for about 20 to 120 minutes at temperatures of from about 60° C. to 100° C. to provide a compound having Formula VIII



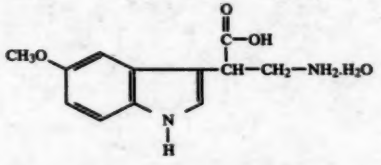
VIII

where R and R_1 are as defined for Compound VII;

(h) separating Compound VIII from the reaction mass, and

(i) hydrolyzing the compound having Formula VIII with an aqueous alkali metal hydroxide at concentrations from about 3N to 11N for about 1 to 15 hours, at temperatures from about 60° C. to 105° C., acidifying the solution to the isoelectric region of Compound I at pH values from about 5.5 to 6.5 and isolating the compound having Formula I.

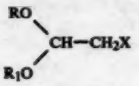
6. A process for preparing a therapeutically useful compound having Formula I



I

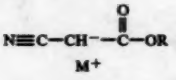
comprising the steps of:

(a) reacting a compound having formula II



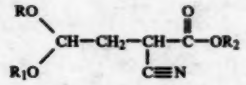
II

where R is a methyl group or an ethyl group, R_1 is a methyl group or an ethyl group, and X is chlorine, bromine or iodine with a compound having Formula III



III

where R is a methyl group or an ethyl group, and M^+ is an alkali metal cation, in a suitable solvent at temperatues in the range of from about 40° C. to 130° C. to provide a compound having Formula IV

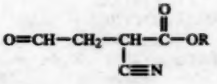


IV

where R is a methyl group or an ethyl group, R_1 is a methyl group or an ethyl group, and R_2 is a methyl group or an ethyl group;

(b) Separating Compound IV from the reaction mass;

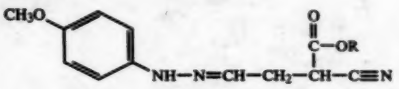
(c) hydrolyzing the compound having Formula IV in a suitable solvent with an aqueous acid solution at concentrations of about 0.1N to 10N for about 1 to 60 minutes at temperatures of from about 20° C. to 100° C. to provide a compound having Formula IX



IX

where R is a methyl group or an ethyl group;

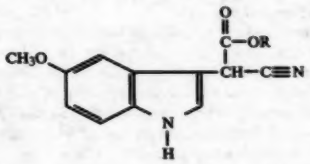
(d) reacting the compound having Formula IX with para-methoxyphenylhyrazine or para-methoxyphenylhydrazine salts in a suitable solvent with an aqueous acid solution at concentrations of about 0.1N to 10N for about 5 to 100 minutes at temperatures of from about 20° C. to 100° C. to provide a compound having Formula X



X

where R is as defined for Compound IX;

(e) reacting the compound having Formula X in a suitable solvent with an aqueous acid solution at concentrations of about 1N to 10N for about 20 to 120 minutes at temperatures of from about 60° C. to 100° C. to provide a compound having Formula XI



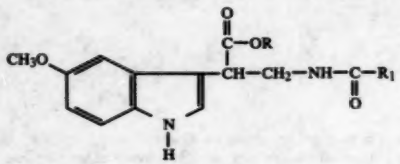
XI

where R is defined as for Compound X;

(f) separating Compound XI from the reaction mass;

(g) hydrogenating the compound having Formula XI under pressure, in the presence of a catalyst, in a suitable solvent selected from the group of acetyl chloride, propionyl chloride, benzoyl chloride, acetic anhydride or propionic anhydride to produce a compound having Formula VIII;

VIII



R is a methyl group or an ethyl group and R_1 is a methyl group, an ethyl group or a phenyl group;

(h) separating Compound VIII from the reaction mass, and

(i) hydrolyzing the compound having Formula VIII with an aqueous alkali metal hydroxide at concentrations from about 3N to 11N for about 1 to 15 hours, at temperatures from about 60° C. to 105° C., acidifying the solution to the isoelectric region of Compound I at pH values from about 5.5 to 6.5 and isolating the compound having Formula I.

4,803,285

GAMMA-BUTYROLACTAMS

Wolfgang Hartwig, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft & Chinese, Leverkusen, Fed. Rep. of Germany and Chinese Academy of Medical Sciences, Beijing, China

Division of Ser. No. 914,210, Oct. 1, 1986, Pat. No. 4,731,455. This application Aug. 27, 1987, Ser. No. 89,897

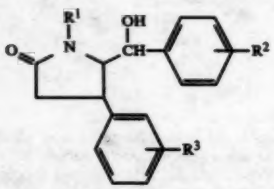
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1985, 3537074; Sep. 25, 1986, 3632589

Int. Cl.[4] C07D *207/12*

U.S. Cl. 548—551 **7 Claims**

1. A compound of the formula (II)

(II)



in which

R^1 represents hydrogen or alkyl with up to 10 carbon atoms, phenyl or benzyl and

R^2 and R^3 are identical or different and represent hydrogen, alkyl with up to 10 carbon atoms, alkoxy with up to 10 carbon atoms, phenyl, benzyl, phenoxy, benzyloxy, benzoyl, acetyl, trifluoromethyl, trifluoromethoxy, nitro, hydroxyl, halogen, amino, carboxyl, sulpho, dialkylamino with up to 4 carbon atoms in the alkyl groups or alkanoylamino with up to 18 carbon atoms,

or a racemate or an optical antipode of said compounds.

4,803,286

AMINO-2-HYDROXYPROPYLOXIMINOHETEROCYCLE α-BLOCKERS

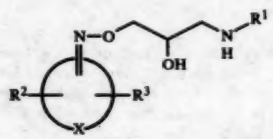
John J. Baldwin, Gwynedd Valley; Gerald S. Ponticello, Lansdale; David C. Remy, North Wales; David A. Claremon, Audubon, and Stella W. King, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 19, 1987, Ser. No. 87,124

Int. Cl.[4] C07D *335/02*; A61K *31/38, 31/385*

U.S. Cl. 514—431 **7 Claims**

1. A compound of structural formula:



or a pharmacologically acceptable salt thereof wherein

X is —S—, or $-S(CH_2)_2S-$;

R^1 is C_{1-6} alkyl, or phenyl-C_{1-6}alkyl; and

R^2 and R^3 are independently

(a) hydrogen,

(b) C_{1-6} alkyl, either unsubstituted or substituted with —OH, —COR^1 or COAr or $OCOR^1$, or

(c) —$COOR^1$:

represents a saturated ring of from 5 to 8 members.

4,803,287

CERTAIN PHOTOCHROMIC FULGIDE COMPOUNDS AND METHOD FOR THEIR SYNTHESIS

Junichi Hibino, Kyoto, and Eiji Ando, Katano, both of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

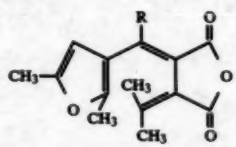
Filed Mar. 9, 1987, Ser. No. 23,253

Claims priority, application Japan, Apr. 16, 1986, 61-86188; Jul. 3, 1986, 61-155113; Oct. 17, 1986, 61-245363; Oct. 17, 1986, 61-245364

Int. Cl.[4] C07D *307/60*

U.S. Cl. 549—252 **4 Claims**

1. A photochromic material represented by the following general formula:



wherein R represents an alkyl chain having 13 to 31 carbon atoms.

4,803,288

PROCESS FOR PRODUCING MACROCYCLIC ESTER COMPOUNDS

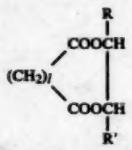
Satoshi Kitamura; Takashi Tobita, both of Chiba; Motoki Kanazawa, Tokyo, and Masahiro Shiozaki, Kanagawa, all of Japan, assignors to Nisso Petrochemical Industries Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 841,893, Mar. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 567,158, Jan. 4, 1984, abandoned, which is a continuation of Ser. No. 395,505, Jul. 6, 1982, abandoned. This application Dec. 17, 1987, Ser. No. 136,437

Int. Cl.[4] C07D *321/00*

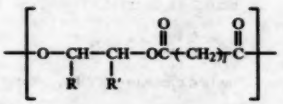
U.S. Cl. 549—267 **1 Claim**

1. A process for producing a macrocyclic ester compound having the general formula:



in which R and R′ both denote a hydrogen atom or one denotes a hydrogen atom and the other denotes an alkyl group selected from the group consisting of methyl and ethyl, l is a positive integer in the range of 6 to 14, said process comprising:

(1) maintaining a linear ester compound having the general repeating unit formula,



in which R, R′ and l are as hereinbefore described, in a molten state with agitation under reduced pressure of 50 mmHg or less whereby the same glycol as one component of said linear ester compound is distilled off;

(2) distilling off said glycol component until said distillation terminates under reduced pressure of 40 to 50 mmHg;

(3) gradually reducing the reaction pressure of 0.1 to 1.0 mmHg to promote depolymerization-cyclization of said linear ester compound in the presence of a catalyst;

(4) distilling off said macrocyclic ester compound and said glycol to a point where agitation becomes difficult;

(5) adding the same said linear ester compound having the general repeating unit formula set forth in step (1) in which the average degree of condensation of said linear ester compound is 20 or less, said compound being added in proportion to the distillation rate of step (4); and then

(6) further removing by distillation said macrocyclic ester compound and said glycol.

4,803,289

PHEROMONES

Brian R. Laurence, London, and John A. Pickett, Kimpton, both of United Kingdom, assignors to National Research Development Corp., United Kingdom

PCT No. PCT/GB82/00301, § 371 Date Jun. 8, 1983, § 102(e) Date Jun. 8, 1983, PCT Pub. No. WO83/01621, PCT Pub. Date May 11, 1983

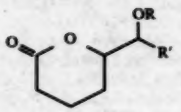
PCT Filed Oct. 22, 1982, Ser. No. 503,139

Claims priority, application United Kingdom, Oct. 27, 1981, 8132367

Int. Cl.[4] C07D *309/30*

U.S. Cl. 549—273 **15 Claims**

1. A compound of formula



(I)

in which R is formyl or alkanoyl of two to ten carbon atoms and R′ of six to twelve carbon atoms substantially free from by-products of manufacture not of the formula (I).

4,803,290

NONANOL/NONENE ANTIMICROBIAL COMPOSITIONS

Basil A. Burke, Palo Alto, Calif., and Muraleedharan Nair, East Lansing, Mich., assignors to PCRI, Inc., Dublin, Calif.

Filed May 29, 1987, Ser. No. 55,645

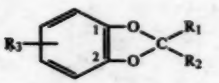
Int. Cl.[4] A01N *43/30*; C07D *317/50, 317/54*

U.S. Cl. 514—464 **16 Claims**

1. An antimicrobial composition comprising in operative combination:

(a) at least one substituted 1,2-alkylidenedioxybenzene compound in an antimicrobially sufficient amount in association with a carrier material for application to plants;

(b) said substituted 1,2-alkylidenedioxybenzene compound being selected from the group consisting essentially of compounds of the formula:



wherein R_3 is selected from 5′-hydroxy-5′-nonanyl and 5′-non-4′-enyl, and R_1 and R_2 are selected from H and C_1–C_5 alkyl, alkenyl and alkynyl groups.

4,803,291

PARTICULATE COMPOSITIONS OF FERROMAGNETIC METAL OXALATES IN THE FORM OF SUBMICRONIC ACICULAR PARTICLES, THE PREPARATION OF SAME AND APPLICATION THEREOF

Abel Rousset, Ramonville St Agne; Christiane B. Salvaing, Toulouse; Paul Mollard, Domene; Alain Manoux, Corbeil Essones, and Philippe Tailhades, Mazamet, all of France, assignors to Centre National de la Recherche Scientifique, Paris and Universite Paul Sabatier, Toulouse, both of, France

PCT No. PCT/FR86/00338, § 371 Date Jul. 2, 1987, § 102(e) Date Jul. 2, 1987, PCT Pub. No. WO87/02033, PCT Pub. Date Apr. 9, 1987

PCT Filed Sep. 30, 1986, Ser. No. 62,941

Claims priority, application France, Sep. 30, 1985, 85 14438

Int. Cl.[4] C07F *11/00*

U.S. Cl. 556—31 **19 Claims**

1. A particulate composition of single or mixed oxalates of ferromagnetic metals, characterized by the fact that it comprises acicular particles having a length of between 0.05 and 0.5 micrometer, with an amount of more than 60% of the particles having a length equal to the average length ±0.1 μm and an acicular ratio of greater than 3, with said average length being between 0.15 and 0.35 μm.

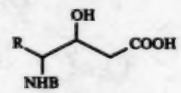
4,803,292

PROCESS FOR PRODUCING STATIN AND RELATED COMPOUNDS

Yasufumi Ohfune, and Masahiro Sakaitani, both of Osaka, Japan, assignors to Suntory Limited, Osaka, Japan

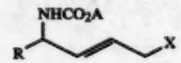
Filed Sep. 4, 1987, Ser. No. 93,271
Claims priority, application Japan, Sep. 4, 1986, 61-208573
Int. Cl.[4] C07C 125/065
U.S. Cl. 560—29 8 Claims

1. A process for producing statin having the general formula:



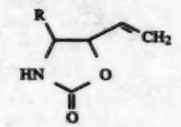
(wherein R is a C1 to C6 alkyl group, a phenyl group or a C7 to C8 phenylalkyl group and B is a protective group for an amino group) characterized by the steps of

treating a silyl carbamate having the formula



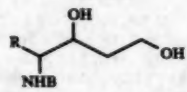
(wherein A is a t-butyldimethylsilyl or t-butyldiphenylsilyl group: X is a bromine atom, a chlorine atom, paratoluenesulfonyloxy or methanesulfonyloxy group and R is as defined above);

with a fluorine-containing ionic reagent in the presence of a null-valent or di-valent palladium and a trivalent organic phosphorus compound to form a cyclic carbamate having the general formula:



(wherein R has the meaning as defined above);

subjecting said cyclic carbonate to a hydroborating reaction, basic oxidation cracking and protection of the amino group to produce a diol having the general formula:



(wherein R and B have the meaning as defined above) and further oxidizing said diol.

4,803,293

TERTIARY AMINES

John Berge, Redhill, and Richard M. Hindley, Reigate, both of England, assignors to Beecham Group plc, Middlesex, England

Continuation of Ser. No. 667,757, Nov. 2, 1984, abandoned. This application Feb. 18, 1987, Ser. No. 17,602
Claims priority, application United Kingdom, Nov. 4, 1983, 8329490; Dec. 22, 1983, 8334294
Int. Cl.[4] C07C 101/30
U.S. Cl. 560—42 1 Claim

1. N-[2-(4-carbomethoxymethoxyphenyl)-1-methylethyl]-N-methyl-2-hydroxy-2-(3-chlorophenyl)ethanamine and pharmaceutically acceptable salts thereof.

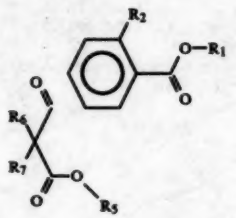
4,803,294

PROCESS AND INTERMEDIATES FOR THE PREPARATION OF HALOGENATED PROTEASE INHIBITORS

Richard A. Mueller, Glencoe, and Richard A. Partis, Evanston, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Oct. 29, 1987, Ser. No. 114,186
Int. Cl.[4] C07C 69/76
U.S. Cl. 560—54 5 Claims

1. A compound of the formula:



wherein R_1 is:

(a) straight or branched chain lower alkyl having 1–6 carbon atoms; or

(b) H;

wherein R_6 is:

(a) straight or branched chain higher alkyl having 13–25 carbon atoms; or

(b) straight or branched chain higher alkenyl having 13–25 carbon atoms;

wherein R_5 is:

(a) straight or branched chain alkyl having 1–6 carbon atoms; or

(b) benzyl;

wherein R_7 is:

(a) straight or branched chain lower alkyl having 1–6 carbon atoms; or

(b) H;

wherein R_2 is:

(a) —Cl, —Br, or —I; or

(b) $-CF_3$.

4,803,295

PURIFICATION OF DIPHENYL PHTHALATES

A. Lee Stautzenberger, and Robert W. Kunkel, both of Nueces, Tex., assignors to Hoechst Celanese Corporation, Bridgewater, N.J.

Filed Sep. 24, 1987, Ser. No. 100,493
Int. Cl.[4] C07C 67/48
U.S. Cl. 560—78 5 Claims

1. A method for purifying a crude diphenyl phthalate ester which comprises subjecting said ester to hydrogenation in the presence of a hydrogenation catalyst and hydrogen at temperatures ranging from about 30° C. to 175° C. for a period of time sufficient to reduce color impurities thereof, and thereafter recovering a diphenyl phthalate ester having improved color properties.

4,803,296

PROCESS FOR THE CO-PRODUCTION OF AROMATIC CARBOXYLATES AND ALKYL IODIDES

Guy R. Steinmetz; Mark Rule; Victor H. Agreda, and Lanney C. Treece, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 11, 1988, Ser. No. 166,948
Int. Cl.[4] C07C 67/37, 11/00
U.S. Cl. 560—80 12 Claims

1. A process for the co-production of an aromatic carboxylic ester and an alkyl iodide which comprises carbonylating an aromatic iodide in the presence of an ether and a catalytic

amount of iridium under aromatic carboxylic ester and alkyl iodide-forming conditions of temperature and pressure.

4,803,297

CARBAMIC ACID ESTER USEFUL FOR PREPARING A NUCLEIC ACID PROBE

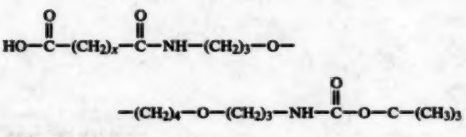
Corey H. Levenson, Oakland, and Kary B. Mullis, Kensington, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 888,252, Jul. 21, 1986, Pat. No. 4,705,886, which is a division of Ser. No. 791,332, Oct. 25, 1985, Pat. No. 4,617,261, which is a continuation-in-part of Ser. No. 683,263, Dec. 18, 1984, Pat. No. 4,582,789, which is a continuation-in-part of Ser. No. 591,811, May 21, 1984, abandoned. This application Jul. 13, 1987, Ser. No. 72,339

Int. Cl.[4] C07C *125/06*

U.S. Cl. 560—159 2 Claims

1. A compound of the formula:



wherein x is 2 or 3.

4,803,298

PROCESS FOR THE PREPARATION OF PERFLUOROALKYL KETONES

Catherine Francese, L'Hay les Roses; Marc Tordeux, Sceaux, and Claude Wakselman, Paris, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Jul. 15, 1987, Ser. No. 73,708

Claims priority, application France, Jul. 25, 1986, 86 10988

Int. Cl.[4] C07C *51/373*

U.S. Cl. 560—174 12 Claims

1. A process for the preparation of a perfluoroalkyl ketone of the formula

wherein R and Rf are as defined below, comprising the step of bringing into contact with one another, in the presence of at least one solvent, for a time sufficient to form said perfluoroalkyl ketone:

(1) a perfluoroalkyl halide of the formula (I)

wherein X represents Br or I and Rf represents a perfluoroalkyl radical containing 1 to 12 carbon atoms in its chain;

(2) zinc and

(3) an ester of the formula (II)

wherein R represents a cyano, perfluoroalkyl or alkoxycarbonyl group and R' represents an alkyl, aryl, alkylaryl or arylalkyl group.

4,803,299

PREPARATION OF POLYTETRAMETHYLENE ETHER GLYCOL DIESTERS HAVING A LOW COLOR NUMBER

Herbert Mueller, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 6, 1987, Ser. No. 34,832

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613106

Int. Cl.[4] C07C *67/24*

U.S. Cl. 560—240 14 Claims

1. In a process for the preparation of a polytetramethylene ether glycol diester by catalytic polymerization of tetrahydrofuran in the presence of a carboxylic anhydride as a promoter and a bleaching earth as a cationic catalyst, the improvement for reducing the color number of the diester product which comprises:

carrying out the polymerization in the presence of from 2 to 0.2% by weight, based on the tetrahydrofuran, of a 1,2-alkylene oxide.

4,803,300

PROCESS FOR SEPARATION OF N-PROTECTED-α-L-ASPARTYL-L-PHENYLALANINES

Toyoto Hijiya, Kawasaki; Tadashi Takemoto, Yokkaichi, and Toshihide Yukawa, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 11, 1987, Ser. No. 84,162

Claims priority, application Japan, Aug. 11, 1986, 61-188341

Int. Cl.[4] C07C *99/12*

U.S. Cl. 562—450 6 Claims

1. A process for separating N-acyl-α-L-aspartyl-L-phenylalanine, which comprises selectively crystallizing N-acyl-α- L-aspartyl-L-phenylalanine from an acetic solution or an aqueous solution of N-acyl-α-L-aspartyl-L-phenylalanine containing (1)N-acyl-α-L-aspartyl-D-phenylalanine, (2)N-acyl-α-L-aspartyl-D-phenylalanine and N-acyl-β-L-aspartyl-L-phenylalanine, (3)N-acyl-α-L-aspartyl-D-phenylalanine and N-acyl-β-L-aspartyl-D-phenylalanine, or (4)N-acyl-α-L-aspartyl-D-phenylalanine, N-acyl-β-L-aspartyl-L-phenylalanine and N-acyl-β-L-aspartyl-D-phenylalanine at a temperature of −5° to 50° C.

4,803,301

PROCESS FOR PRODUCING OPTICALLY ACTIVE 2-PHENOXYPROPIONIC ACID

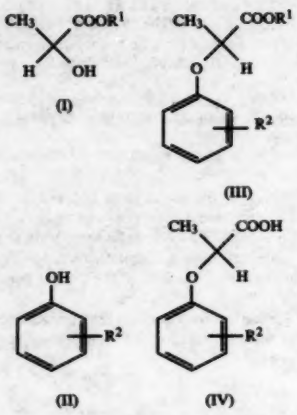
Masayuki Sakakibara, and Yasushi Nii, both of Machashi, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,078

Int. Cl.[4] C07C *59/12*

U.S. Cl. 562—471 6 Claims

1. A process for producing an optically active 2-phenoxypropionic acid, which comprises allowing an optically active lactic ester represented by the following formula (I) to react with a phenol represented by the following formula (II) in the co-presence of a reagent A and a reagent B defined below to form an optically active 2-phenoxypropionic ester represented by the following formula (III), and liberating an optically active 2-phenoxypropionic acid represented by the following formula (IV) from the optically active 2-phenoxypropionic ester:



(I) (III) (II) (IV)

wherein R^1 represents a group to form a monovalent ester, which can be eliminated from the compound (III) under weakly basic to acidic conditions and R^2 represents a hydrogen atom or 1 to 5 substituents which do not interfere in the reaction between the compounds (I) and (II);

a reagent A being at least one compound selected from the group consisting of trialkylphosphine, trialkylphosphite, triarylphosphine and triarylphosphite; and

a reagent B being at least one compound selected from the group consisting of dialkylazodicarboxylate and diarylazodicarboxylate.

4,803,302

PROCESS FOR THE PRODUCTION OF METHACRYLIC ACID

Motomu Oh-Kita; Masaaki Kato, and Masao Kobayashi, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00008, § 371 Date Aug. 21, 1987, § 102(e) Date Aug. 21, 1987, PCT Pub. No. WO87/04086, PCT Pub. Date Jul. 16, 1987

PCT Filed Jan. 6, 1987, Ser. No. 103,580

Claims priority, application Japan, Jan. 8, 1986, 61-1684; Jan. 9, 1986, 61-2632

Int. Cl.[4] C07C *51/25, 57/055*

U.S. Cl. 562—534 **7 Claims**

1. A process for the production of methacrylic acid by the vapor phase catalytic oxidation of methacrolein with molecular oxygen comprising contacting a raw material gas containing methacrolein and molecular oxygen with a catalyst represented by the formula

$$P_aMo_bV_cFe_dCu_eZ_fX_gY_hO_i$$

wherein X represents at least one of the elements selected from the group consisting of potassium, rubidium, cesium and thallium, Y represents at least one of the elements selected from the group consisting of tellurium, lanthanum, boron, silver, chromium, magnesium and barium, Z represents any one of the elements of zirconium or antimony, a to i denote atomic ratios of the respective elements and b=12, a=0.3–4, c=0.01–3, d=0.1–4, e=0.01–3, f=0.01–3, g=0.01—3, h=0.001–5 and i denotes the number of oxygen atoms required for satisfying the valence number of said elements.

4,803,303

N-SUBSTITUTED PSEUDO-AMINOSUGARS, THEIR PRODUCTION AND USE

Satoshi Horii, Saksi; Yukihiko Kameda, Kanazawa, and Hiroshi Fukase, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

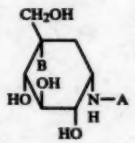
Division of Ser. No. 334,986, Dec. 28, 1981, Pat. No. 4,701,559. This application Apr. 17, 1987, Ser. No. 39,277

Claims priority, application Japan, Jan. 5, 1981, 56-561; Jun. 2, 1981, 56-84635; Oct. 6, 1981, 56-159657

Int. Cl.[4] C07C *87/36, 87/452*

U.S. Cl. 564—462 **4 Claims**

1. A compound of the formula



wherein A is a cyclic hydrocarbon group having 3 to 7 carbon atoms which may be substituted by hydroxy and B is hydrogen or hydroxyl.

4,803,304

RECOVERY OF BIS(HEXAMETHYLENE)TRIAMINE

Robert A. Smiley, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 15, 1987, Ser. No. 38,659

Int. Cl.[4] C07C *85/26*

U.S. Cl. 564—498 **5 Claims**

1. A process for the recovery of bis(hexamethylene)triamine from hexamethylenediamine still heels, which comprises (1) contacting the still heels with an aliphatic hydrocarbon having a boiling point between about 34° C. and about 210° C. whereby the bis(hexamethylene)triamine is extracted from the still heels and dissolved in the aliphatic hydrocarbon, (2) separating the aliphatic hydrocarbon containing the dissolved bis(hexamethylene)triamine from the remaining components of the still heels, and then (3) separating the bis(hexamethylene)-triamine from the aliphatic hydrocarbon.

4,803,305

ISOBUTANE OXIDATION IN THE PRESENCE OF A SOLUBLE IRON COMPLEX AS CATALYST

John R. Sanderson, Leander; Edward T. Marquis, Austin, and Jiang-Jen Lin, Round Rock, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 27, 1987, Ser. No. 125,965

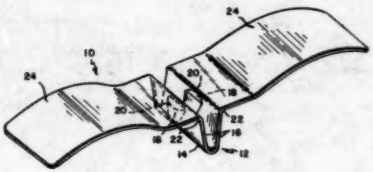
Int. Cl.[4] C07C *179/025, 31/12*

U.S. Cl. 568—571 **4 Claims**

1. The method for oxidizing isobutane with an oxygen-containing material in the presence of an effective amount of a soluble catalyst of the formula $Fe_3O(Pivalate)_6(MeOH)_3Cl$.

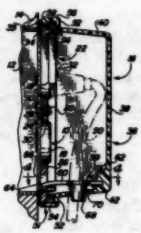
ELECTRICAL

4,803,306
ELECTROMAGNETIC SHIELDING CLIP
Richard G. Malmquist, Winchester, Mass., assignor to Computervision Corporation, Bedford, Mass.
Filed Jun. 3, 1987, Ser. No. 57,610
Int. Cl.[4] H05K 9/00
U.S. Cl. 174—35 GC **28 Claims**



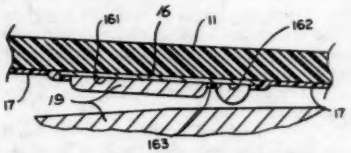
1. An electromagnetic shielding clip comprising an elongate metal strip of sheet material of uniform thickness and width, said strip having spaced, parallel sides and ends and embodying midway between its opposite ends a U-shaped deviation comprising an attaching portion embodying a bottom part and upwardly-diverging planar side parts, said strip further embodying at the upper ends of said diverging side parts outwardly-bent planar flange parts on each side of the side parts disposed at right angles to the vertical center line of the diverging side parts, a notch formed in each of the side parts below the flange parts defining a non-deformable ledge in the side parts spaced from and parallel to the flange parts at the upper ends of the side parts, said ledges, in conjunction with the flange parts, defining a clamp for attaching the structure to a panel containing an opening for receiving the attaching portion and a cantilever-supported contact wing constituting an extension of one of the flange parts extending from the distal end of said one of the flange portions.

4,803,307
WEATHERPROOF OUTLET COVER
Michael J. Shotey, 7733 E. Cypress, Scottsdale, Ariz. 85257
Filed Jun. 29, 1987, Ser. No. 66,993
Int. Cl.[4] H02G 3/18
U.S. Cl. 174—67 **18 Claims**



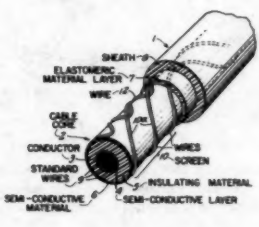
1. A weatherproof cover for an outdoor electrical outlet, said cover comprising:
(a) a waterproof, corrosion-resistent, and electrically non-conductive mounting plate;
(b) fastener means for demountably securing said mounting plate to the outlet;
(c) said mounting plate including a top edge and a lip formed in said top edge;
(d) a waterproof, corrosion-resistant lid member for enclosing the outdoor electrical outlet and the plug of at least one electrical cord mountable therein, said lid member being movably attached to said mounting plate and having at least one access slot formed therein for allowing the electrical cord portion of the plug to extend from said lid member;
(e) said lid member including a top wall and a hook portion depending from said top wall for engaging said lip to pivotally engage said lid member with said mounting plate;
(f) a first sealing member for disposition between said mounting plate and the outlet for preventing passage of foreign elements therebetween; and
(g) a second sealing member disposed between said mounting plate and said lid member for preventing passage of foreign elements therebetween.

4,803,308
PRINTED CIRCUIT BOARD
Toshimichi Taguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 17,153, Feb. 20, 1987, abandoned. This application May 27, 1988, Ser. No. 201,337
Claims priority, application Japan, Feb. 21, 1986, 61-24915[U]
Int. Cl.[4] H05K 1/00
U.S. Cl. 174—68.5 **13 Claims**



1. In a printed circuit board including a substrate having a surface and copper foil pieces attached on said surface with some areas of said pieces being covered and other areas exposed, said exposed areas of said copper foil pieces describing a pattern, the improvement wherein said pattern includes a first part and a second part, said first part being elongated along and defining a line and said second part being separated from said first part being shorter than said first part and located on said line.

4,803,309
ELECTRICAL CABLE WITH OPEN HELIX SCREEN WIRES ELECTRICALLY CONTACTING A LONGITUDINAL WIRE AND MANUFACTURE THEREOF
Carlo Marin, Pavia, and Cesare Seveso, Milan, both of Italy, assignors to Societaá Cavi Pirelli S.p.A., Milan, Italy
Filed Feb. 25, 1987, Ser. No. 18,592
Claims priority, application Italy, Feb. 28, 1986, 19598 A/86
Int. Cl.[4] H01B 7/22
U.S. Cl. 174—106 R **11 Claims**



1. In an electrical cable comprising a cylindrical core which is formed by at least one electrical conductor with extruded insulation therearound and comprising a screen upon said core formed by a plurality of metal wires applied to said core along

paths conforming to an open helix, the improvement comprising at least a further metal connecting wire which extends longitudinally along a path which is undulated with respect to a generatrix of said core, which extends in the direction of and parallel to a generatrix of said core, which extends transversely to said paths of said plurality of metal wires without encircling said core and which is in electrical contact with all the wires of said screen, and a layer of extruded material around said core and at least partially embedding said wires of said screen and said further metal connecting wire whereby said wires of said screen and said further connecting wire are held in their respective positions by said layer.

8. Process for applying a screen of metal wires in an open helix configuration around the core of a cable comprising:

while longitudinally advancing a core, depositing on the core a plurality of parallel metal wires while producing relative motion between said wires and the core in alternately different directions circumferentially of the core to cause said wires to follow paths conforming to an open helix configuration; and

before so depositing said plurality of metal wires on the core and while so advancing the core, depositing at least one other metal wire on the core in electrical contact with all said plurality of metal wires, said one other metal wire being deposited along a path which is undulated with respect to a generatrix of the core, which extends longitudinally and in the direction of and parallel to the generatrix of the core and which extends transversely to the paths of said plurality of parallel metal wires without encircling said core; and

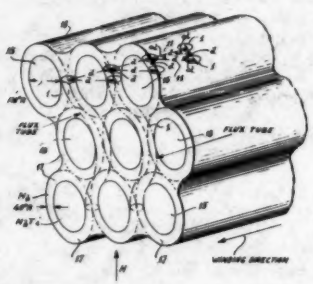
at the point where said plurality of metal wires are deposited on the core, extruding a layer of material over said plurality of metal wires.

4,803,310

SUPERCONDUCTORS HAVING CONTROLLED LAMINAR PINNING CENTERS, AND METHOD OF MANUFACTURING SAME

Bruce A. Zeitlin, Cheshire, Conn.; Michael S. Walker, Schenectady, N.Y., and Leszek R. Motowidlo, Southington, Conn., assignors to Intermagnetics General Corporation, Guilderland, N.Y.

Filed May 4, 1987, Ser. No. 45,386
Int. Cl.[4] H01B *12/00*
U.S. Cl. 174—128 S **24 Claims**



1. A superconductor formed of an array of subfilaments, said superconductor having enhanced J_c for a predetermined field and substantially continuous, non-random pinning centers, said superconductor including

a plurality of parallel superconductive subfilaments of uniform cross-sectional area, said subfilaments being embedded in pinning jackets to provide pinning density, and said pinning jackets together forming a unitary structure having a honeycomb-like cross-section, with said structure extending uniformly and substantially continuously from one side of said superconductor to the other,

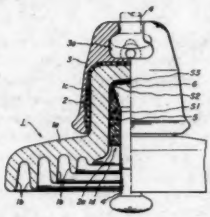
whereby a plurality of substantially continuous paths for fluxoids across said superconductor are provided, the total said pinning density of said superconductor is substantially increased, and the critical current of said superconductor is enhanced.

4,803,311

SUSPENSION INSULATOR

Tsutomu Moriya, Chita, and Hiroshi Nozaki, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jan. 25, 1988, Ser. No. 147,999
Claims priority, application Japan, Feb. 4, 1987, 62-24214
Int. Cl.[4] H01B *17/08*
U.S. Cl. 174—182 **1 Claim**



1. A suspension insulator, comprising:

a porcelain insulating member including a head portion and a shed portion extending radially from said head portion, said head portion having an inner pin hole with a closed top and an open bottom, said pin hole having an inside surface including a cylindrical surface portion adjacent said open bottom, a curved top surface portion facing said open bottom and a round corner surface portion forming a smooth boundary between said cylindrical surface portion and said curved top surface portion, said cylindrical surface portion having a radius equal to D and said round corner surface portion having a radius of curvature equal to Y, such that a ratio of Y/D is in the range of 0.3–0.45;

a metal cap cemented to the outer surface of said head portion; and

a metal pin cemented within said pin hole of said head portion, said inside surface of said pin hole including a cemented portion which has sands rigidly deposited thereon over a range extending from a bottom of said cemented portion adjacent said open bottom, to a level within ±3 mm of a junction between said cylindrical surface portion and said round corner surface portion.

4,803,312

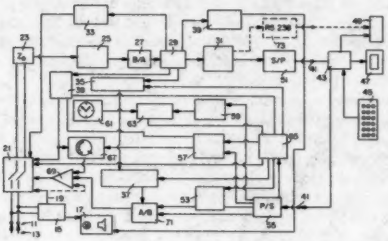
INTERFACE BETWEEN PERSONAL COMPUTER AND TELEX COMMUNICATION SYSTEM

Jose D. Britos, Córdoba, Argentina, assignor to Asecom S.C.L., Cordoba, Argentina

Filed May 7, 1987, Ser. No. 47,935
Claims priority, application Argentina, May 16, 1986, 303987
Int. Cl.[4] H04L *13/08*
U.S. Cl. 178—17 R **15 Claims**

1. An intelligent interface for connecting a personal computer or the like to a communication line in order to transform it into a telex transceiver, said personal or similar computer including an input and output port through which it is possible to receive and/or transmit texts in the accepted characters format, according to a conventional telex norm, and/or receive and/or transmit messages to or from the interface, and a medium of visualization of the text received and to be transmitted, said intelligent interface comprising: a call detector means connected to the communication line; a connecting means in

circuit with said line having control means for opening and closing the interface to an input signal to the said call detector means from said communication line; a Baudot signal receiver means having a data input connected to the communication line through said connecting means; a character analyzer means connected to an output of said Baudot signal receiver means that includes command and text detector means; a received texts memory means connected to the output of said Baudot signal receiver means through said character analyzer means and an output connectable to an input of the medium of visualization of the text received, a line exciter means having



an output connected to said communication line; Baudot signal transmitter means connected to an input of said exciter means; emerging texts memory means connected to an input of said Baudot signal transmitter means; a parallel to serial converter means which has an output connected to said emerging texts memory means, and an input connected to said input and output port; an answerback memory means connected between said character analyzer means and said Baudot signal transmitter means; an addressees' telex numbers memory means connected to said input and output port; and a dial connected between said addressees' telex numbers memory means, and said line exciter means.

4,803,313

ELECTRIC SWITCH WITH SEALED PLURAL COMPARTMENTS

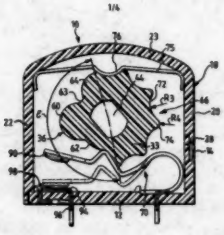
Wilfried Rolf, Oberursel, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,349

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644212

Int. Cl.[4] H01H *21/08*

U.S. Cl. 200—6 BB **11 Claims**



1. An electric switch comprising housing structure that defines two chambers, shaft structure rotatably carried in said housing structure, said shaft structure including a flange surface adjacent each end and two axially offset switching coulisses on said shaft structure for rotation therewith, each of said switching coulisses being disposed in a corresponding housing chamber and said housing structure including sealing flange members welded to the front and rear walls of said housing structure,

O-rings arranged pressure-tight between said flange surfaces adjacent the ends of said shaft structure and said sealing flange members,

each of the housing chambers having a contact spring and a fixed contact element disposed therein and connection lug structure external thereof for providing electrical connection to said contact spring and said contact element, each said contact spring carrying a movable contact element,

each of said switching coulisses being adapted to be rotated by said shaft structure to displace its associated contact spring between a first switch position in which said associated contact spring is in abutment with its said fixed contact element and a second position in which said associated contact spring is spaced from its said fixed contact element,

a first of said switching coulisses including a first circular segment on which at least one control cam is disposed and a second circular segment on which a series of ratchet elements are disposed, the two said circular segments of the first switching coulisse being arranged in a common plane; and

a detent spring loosely arranged in said housing structure, said detent spring including a bulge portion which is conformed to the profiles of said ratchet elements for fixing said switching coulisses in a series of angular positions.

4,803,314

MOMENTARY ROTARY SWITCH

Richard W. Sorenson, Avon; Milton N. Ives, Wolcott, and Frank P. Sapone, Waterbury, all of Conn., assignors to Carlingswitch, Inc., West Hartford, Conn.

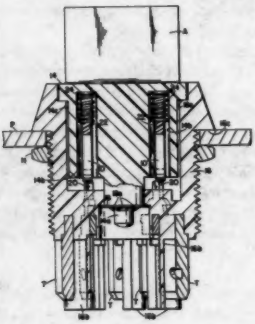
Continuation-in-part of Ser. No. 945,880, Dec. 22, 1986, Pat. No. 4,748,297, which is a continuation-in-part of Ser. No. 884,545, Jul. 11, 1986, abandoned. This application Jul. 30, 1987, Ser. No. 83,939

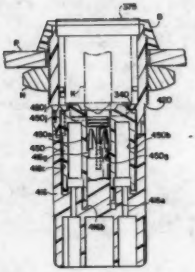
Int. Cl.[4] H01H *15/58, 27/08*

U.S. Cl. 200—11 J **35 Claims**

1. A rotary switch comprising a generally cylindrical dielectric body portion defining an upwardly open cavity of generally cylindrical shape, said cavity having a cylindrical wall and a longitudinal central axis, said body portion having a bottom wall defining a plurality of circumaxially spaced openings, fixed contacts provided in at least some of said openings such that upper ends thereof are located between said cavity axis and the cylindrical cavity wall, a generally cylindrical dielectric control member rotatably received in said cylindrical cavity, means for restraining said control member from movement axially in said cavity, said control member having at least one downwardly open recess spaced radially from said cavity axis the same distance as that for said fixed contact upper ends, a movable contact in said recess, means in said recess for biasing said movable contact downwardly toward said fixed contact upper ends, said bottom cavity wall having a contour that cooperates with said fixed contact upper ends to permit said movable contact to close adjacent fixed contacts in response to angular rotational movement of said control member, and torsion spring biasing means provided in a spring opening defined in part by said control member and in part by said body portion, said torsion spring means biasing said con-

trol member toward a predetermined angular position so that the rotary switch exhibits a momentary action as the control





member is rotated from said predetermined position to close said adjacent fixed contacts.

4,803,315

PRINTED CIRCUIT BOARD

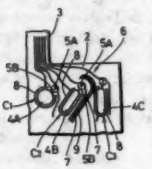
Mitsumasa Kako, Tokai, and Sadashi Hirano, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 16, 1987, Ser. No. 121,058

Claims priority, application Japan, Nov. 20, 1986, 61-277338

Int. Cl.[4] H01H *13/14*

U.S. Cl. 200—5 A **14 Claims**



1. A printed circuit board for a keyboard which has a plurality of keys substantially arranged along rows and columns so as to form a matrix-like key arrangement, comprising:

a dielectric film having opposite first and second surfaces and extending under the keyboard;

a plurality of first capacitor electrodes formed on said first surface of said dielectric film, each of said first capacitor electrodes having a predetermined area;

a plurality of switch electrode pairs formed on said first surface of said dielectric film, wherein a location of each of said switch electrode pairs corresponds to a location of each key, and each of said switch electrode pairs is connected to each other when a corresponding key is depressed, and each of said switch electrode pairs is disconnected to each other when the corresponding key is not depressed, and one side of each of said switch electrode pairs is connected to each of said first capacitor electrodes;

a plurality of first lead patterns formed on said first surface of said dielectric film, wherein each of said first lead patterns is connected to the other side of said switch electrode pairs;

a plurality of second capacitor electrodes formed on said second surface of said dielectric film and arranged in such a manner that each of said second capacitor electrodes opposes to each of said first capacitor electrodes whereby a pair of opposing said first and second capacitor electrodes form a capacitor; and

a plurality of second lead patterns formed on said second surface of said dielectric film, wherein said second lead patterns are connected to said second capacitor electrodes; wherein a plurality of said pairs of said first and second capacitor electrodes are arranged in such a manner that a space defined by adjacent said pairs is enlarged more than a hypothetical space to be defined by adjacent hypothetical capacitor electrode pairs if the same had the same shape and were arranged regularly with respect to the matrix-like key arrangement.

4,803,316

PUSH BUTTON SWITCH USING DOME SPRING AND SWITCH ELEMENT THEREOF

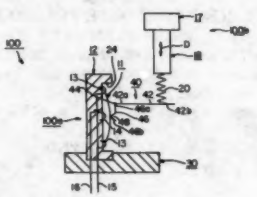
Kazutoshi Hayashi, Kawasaki; Hideo Nabetani, Nagano; Toshiaki Tanaka, Kawasaki, and Kazushi Ishida, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 16, 1986, Ser. No. 919,756

Claims priority, application Japan, Oct. 16, 1985, 60-158068[U]; Dec. 23, 1985, 60-197982[U]; Mar. 11, 1986, 61-035073[U]; Apr. 18, 1986, 61-059208[U]

Int. Cl.[4] H01H *5/18*

U.S. Cl. 200—406 **20 Claims**



1. A push button switch comprising:

a bottom plate;

a plunger and an associated key top;

means for mounting said plunger and associated key top for limited, reciprocating movement along a generally vertical axis relative to a generally horizontal orientation of said bottom plate;

a terminal plate affixed to said bottom plate in a vertical orientation relative to said horizontal orientation of said bottom plate, the terminal plate having a first major surface generally parallel to the vertical axis, an indented surface with a periphery of a predetermined configuration displaced inwardly of and parallel to the major surface in a first horizontal direction relatively to the vertical axis and a central recess within the indented surface, further displaced from the indented surface in the first horizontal direction;

plural outer contacts fixedly mounted at predetermined positions on said terminal plate within and adjacent the

periphery of the indented surface and disposed to protrude toward said first major surface; plural inner contacts and means for flexibily mounting said plural inner contacts within the recess in the indented surface of the terminal plate, centrally of the periphery of the indented surface and protruding toward the first major surface, the mounting means resiliently urging the plural inner contacts toward the first major surface and thus in a second horizontal direction, opposite to the first horizontal direction, and permitting limited, resiliently yielding movement of the plural inner contacts in the first horizontal direction;

a dome spring disposed in a generally vertical orientation and having a convex configuration oriented in the second horizontal direction, said dome spring having a substantially continuous surface normally in the aforesaid convex configuration in the second horizontal direction and being susceptible to a depressing force applied thereto in the first, opposite horizontal direction to snap to a convex configuration oriented in the first horizontal direction and upon release of the force to resiliently return to the second horizontal direction, the periphery of the dome spring being normally in contact with the plural outer contacts in each of the first and second horizontal directions of its convex configuration; and

an actuator interconnecting said plunger and said dome spring and responsive to downward vertical movement of said plunger to apply a depressing force in the first horizontal direction for depressing and causing said dome spring to snap to the first horizontal direction, thereby to complete an electrical connection through said dome spring between said first and second contacts, the actuator comprising a lever having first and second arms extending at right angles from one another in a plane transverse to the main surface of the terminal plate and parallel to the generally vertical axis, the free end of the first arm defining a spring seat aligned with the generally vertical axis, means associated with the second arm of the lever for engaging and applying said depressing force to said dome spring and means for mounting the lever for limited pivotal movement about a pivot axis transverse to the first and second arms and adjacent and parallel to the plane of the indented surface of the terminal plate, the actuator further comprising a coil spring received on the spring seat of the first arm and connected to the plunger.

4,803,317

SUPPORT STRUCTURE FOR ROCKABLE CONDUCTIVE PLATE IN A SEESAW-TYPE SWITCH

Hiroki Sutoh, Miyagi, and Kenji Sawada, Furukawa, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Oct. 15, 1987, Ser. No. 109,276

Claims priority, application Japan, Jan. 19, 1987, 62-4987[U]

Int. Cl.[4] H01H *23/24*

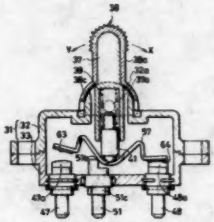
U.S. Cl. 200—438 **2 Claims**

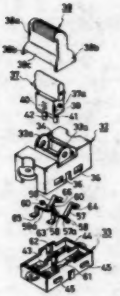
1. In a three-position seesaw-type switch comprising a casing having a bottom wall, a top wall, and a first side and a second side positioned opposite each other in a longitudinal direction, a first stationary contact provided on the bottom wall on the first side, a second stationary contact provided on the bottom wall on the second side, an intermediate stationary contact provided on the bottom wall between the first and second stationary contacts, a rockable conductor plate with a first movable contact on a first side thereof and a second movable contact on a second side thereof which are moved into contact with the first and second stationary contacts when the conductor plate is rocked in a first direction and in an opposite, second direction, respectively, and a rockable driver mounted through the top wall of the casing having a driving end slidable abutting on the conductor plate for rocking it in the first and second directions,

the improvement comprising:

said intermediate stationary contact being disposed at a position off-center toward said first side of said casing in the longitudinal direction from a center position between said first and second stationary contacts, and having an upper bearing surface and a cutout portion cut into said upper surface so as to form a fulcrum edge facing toward said center position;

said conductor plate having substantially an M-shape with a center portion provided with a lower bend between said first and second sides of said M-shaped conductor plate, wherein said lower bend is positioned substantially at said center position between said first and second stationary contacts facing toward said bottom wall, and said conductor plate has opposing lateral projections located in alignment with the off-center position of said intermediate stationary contact and extending in opposite lateral directions perpendicular to said longitudinal direction;





said casing having opposing lateral walls provided with guide grooves for receiving said lateral projections respectively therein for holding said conductor plate stably in position in said casing;

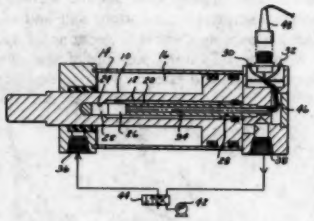
wherein when said rockable driver has its driving end abutting said lower bend of said M-shaped conductor plate, said conductor plate is in one stable position with said first side thereof bearing in contact against said fulcrum edge of said off-center intermediate stationary contact, and when said rockable driver is rocked in the first direction, said conductor plate is rocked over said fulcrum edge of said off-center intermediate stationary contact as a fulcrum point to bring said first movable contact into electrical contact with said first stationary contact in another stable position.

4,803,318

PROXIMITY SWITCH FOR A CYLINDER

Robert K. Lymburner, 4085 Clinton River Dr., Clinton River Mobile Park, Mt. Clemens, Mich. 48043

Filed Jan. 7, 1988, Ser. No. 141,552
Int. Cl.[4] H01H *35/38*
U.S. Cl. 200—82 R **13 Claims**



7. A proximity switch comprising:

a movable member having a first end, a second end and an aperture extending from the first end toward the second end, said movable member traveling along a fixed path between a first position and a second position, said aperture including a first protruding shoulder narrowing said aperture adjacent said first end and a second protruding shoulder narrowing said aperture adjacent said second end;

a housing having a first end and a second end, said housing enclosing the first end of the movable member with said second end of said movable member extending outwardly from said second end of said housing, said housing forming a first fluid chamber between said first end of said housing and said movable member and forming a second fluid chamber separate from said first fluid chamber between said second end of said housing and said movable member, wherein expansion of said first fluid chamber drives said movable member to said first position and expansion of said second fluid chamber drives said movable member to said second position;

a sensor-supporting member having a first end connected to the first end of said housing and a second end extending outwardly from said first end of said housing toward said second end of said housing, said sensor-supporting member engaged within said aperture of said movable member; and

sensor means mounted adjacent said second end of said sensor-supporting member for sensing said first position of said movable member by engagement with said first shoulder and for sensing said second position of said movable member by engagement with said second shoulder.

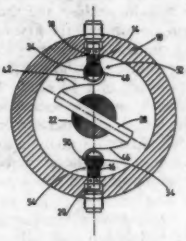
4,803,319

ROTARY SWITCH WITH CURVED ARC ROOT MIGRATION TRACK

Georges Bernard, St. Egreve; Bernard Bouvet, Echirolles; Richard Jacolin, Voiron; Guido Colleoni, Bergamo; Jacques Gaillard, Grenoble, and Robert Volsy, Tullins, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Jun. 14, 1988, Ser. No. 206,310
Claims priority, application France, Jun. 25, 1987, 87 09009
Int. Cl.[4] H01H *33/18, 33/60*
U.S. Cl. 200—147 A **10 Claims**

1. A medium voltage rotary switch comprising a sealed enclosure, having an internal periphery, two stationary contacts fixed at diametrically opposed points of said periphery, a contact bridge having ends arranged as movable contacts, each capable of cooperating with one of said stationary contacts to form a pair of contacts, a rotating operating shaft supporting said contact bridge, which can selectively occupy a closed position in which the two pairs of contacts are closed and an open position in which the two pairs of contacts are open, at least one of the contacts of one of said pairs comprising a migration track of the root of an arc drawn when the pair of contacts opens, said track extending in the opposite direction from the other contact of said one of said pairs, and



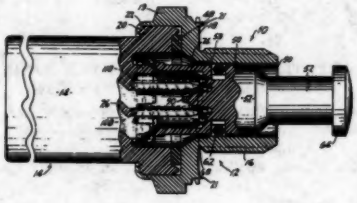
having a hidden location to enable the arc root and the associated hot spot to move towards said hidden location where the two hot spots associated with the two arc roots are not facing and a permanent magnet, securedly fixed to the migration track contact, is arranged to blow the arc root towards said hidden location to favor arc extinction and current breaking.

4,803,320

ELECTRIC SWITCH CONSTRUCTION

Peter J. Lupoli, Hamden, and Donald J. Mattis, Norwalk, both of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Jul. 8, 1987, Ser. No. 71,072
Int. Cl.[4] H01H *3/00*
U.S. Cl. 200—342 **6 Claims**



1. A self-adapting electric switch construction comprising, in combination:

(a) a body member having means for attaching it to a supporting structure, and having a stationary electrical contact,

(b) a movable electrical contact cooperable with said stationary contact for making and breaking an electrical circuit,

(c) means for movably mounting said movable contact on the body member,

(d) said body member having a movable plunger operable to actuate said movable contact, and

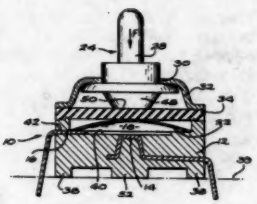
(e) a compression coil spring having an anchored end and an exposed, accessible free-standing end, said anchored end being carried by and retained by said plunger, said free-standing end being fully exposed and adapted for driving movement by an external actuator, thereby to constitute a yieldable driving means between the plunger and the external actuator.

4,803,321

AXIAL LOAD RESISTANT KEY SWITCH

Jean-Claude Lefebvre, Dole, France, assignor to ITT Composants Et Instruments, Bagneux, France

Filed Nov. 16, 1987, Ser. No. 121,206
Int. Cl.[4] H01H *1/14, 9/02*
U.S. Cl. 200—517 6 Claims



1. In a key switch comprising an electrically insulating base having a bottom and an upstanding lateral wall defining a cavity closed by a cap, a central contact and a lateral contact mounted on said bottom, a dome-shaped switching element mounted in said cavity over said contacts, the periphery of said element being in electrical contact with said lateral contact, said element being elastically yieldable to establish an electrical connection between said contacts in response to an axial load exerted on the convex face of said element, an actuator for exerting said axial load, said actuator having a facing portion disposed over said element and a stem passing through a central hole in said cap, the improvement which comprises:

said bottom of said base having a plane central portion facing said switching element;

said central contact comprising an upstanding projection having an essentially flat contacting surface facing said switching element, said projection being embedded in said base with said flat contacting surface being flush with said plane central portion; and

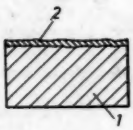
said facing portion of said actuator being a flat face generally parallel to said flat contacting surface.

4,803,322

ELECTRICAL CONTACTS FOR ELECTRIC BREAKERS

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Tokyo, Japan

Filed May 9, 1985, Ser. No. 732,053
Claims priority, application Japan, May 19, 1984, 59-101451
Int. Cl.[4] B22F *3/00*; H01H *1/02*
U.S. Cl. 200—268 5 Claims



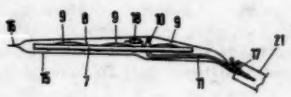
1. Electrical contacts for use with electric breakers and the like, consisting of a base made from a silver alloy containing tin and indium, and a thin layer clad over the base and being made from an other silver alloy, said other silver alloy being selected from the group consisting of Ag—Cd and Ag—Sn—Bi alloys, said silver alloys having been internally oxidized, and said other silver alloy layer having a thickness extremely smaller than that of said base.

4,803,323

ELECTRIC MANUAL SWITCHING DEVICE HAVING ENVIRONMENTALLY PROTECTED COMPONENTS

Karl-Heinz Bauer, and Gerold Eckert, both of Bad Neustadt/Saale, Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt/Saale, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 8,823
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1986, 8602882
Int. Cl.[4] H01H *13/06*
U.S. Cl. 200—302.2 1 Claim



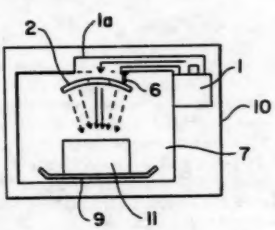
1. An electrical manual switching device comprising a housing; a printed circuit board having electrical conductors disposed thereon, said printed board mounted in said housing; a plurality of switching contacts provided on said printed circuit board; a plurality of pushbutton elements disposed on said housing, each of said plural pushbutton elements facing a corresponding one of said plural switching contacts; and a connecting cable, said switching contacts capable of electrical connection with said connecting cable via said electrical conductors; characterized in that said electrical manual switching device further comprises a foil extending continuously over said printed circuit board, said foil being disposed in said housing between said switching contacts and said pushbutton switching elements wherein said foil consists of a flexible material and seals said switching contacts and said printed circuit board conductors from the interior of said housing, said foil shaped like a bag, said printed circuit board with said switching contacts being inserted into said foil, said bag-shaped foil loosely enclosing said printed circuit board with said switching contacts, said foil tightly closed at both ends, with said connecting cable extending from one end, said foil introduced at said one end into a plug connection.

4,803,324

MICROWAVE HEATING AND INFRARED RAY HEATING APPLIANCE

Masanobu Fujii, Yao, and Tatsuya Tsuda, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 828,897, Feb. 13, 1986, abandoned. This application Dec. 15, 1987, Ser. No. 134,551
Claims priority, application Japan, Feb. 15, 1985, 60-20624[U]; Mar. 15, 1985, 60-38013[U]
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 F 4 Claims



1. A heating appliance comprising:

a housing,

means for supporting an object in said housing,

means in said housing for generating microwaves and directing said microwaves to strike said object,

a heating plate positioned between said microwave generating means and said supporting means so that a portion of said microwaves impinge on said heating plate, said heating plate absorbing and converting microwave energy into infrared radiation,

said heating plate having at least one opening therein so that a portion of said microwaves may freely pass through said heating plate and impinge on an object positioned on said supporting means,

said heating plate comprising a heat radiating plate and an infrared radiator layered on said heat radiating plate,

said infrared radiator including means producing infrared rays in response to said infrared radiator being heated by the conduction of heat from said heat radiating plate, whereby microwave energy is absorbed by said heat radiating plate and is converted into heat which is conducted to said infrared radiator which converts the heat into infrared radiation, and

said infrared rays, in addition to said freely passing microwaves, being directed to strike said supporting means and said object.

4,803,325

RESISTANCE SEAM WELDING MACHINE

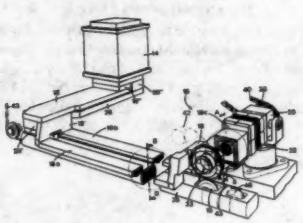
Matthias Frei, Wettingen; Willi Mueller, Berikon, and Werner Sutter, Oberehrendingen, all of Switzerland, assignors to Elpatronic AG, Switzerland

Filed Jan. 6, 1988, Ser. No. 141,927

Claims priority, application Switzerland, Feb. 9, 1987, 00446/87

Int. Cl.[4] B23K *1/16*

U.S. Cl. 219—64 **11 Claims**



1. A resistance seam welding machine, particularly for the longitudinal-seam welding of can bodies (4), having a welding transformer (14) and having a secondary loop (16) consisting of feed and return lines, with a pendulum roller head (20) in which a pendulum arm (24) carrying an upper electrode roller (8) is mounted for rotation, having a lower arm (26) carrying a lower electrode roller, having a first busbar (18) leading from the welding transformer (14) to the pendulum roller from the welding transformer (14) to the lower arm (26), characterized in that the feed and return lines in the region of the secondary loop (16) situated between the welding transformer (14) and the lower arm (26) being a parallel line and in the region of the pendulum roller head (20) being in the form of a coaxial line.

4,803,326

WIRE-CUT ELECTRIC DISCHARGE MACHINE IN WHICH TWO ADJOINING SEGMENTS OF A COMMON ELECTRODE EFFECT MACHINING

Inoue Kiyoshi, Tokyo, Japan, assignor to Inoue Japax Research Incorporated, Tokyo, Japan

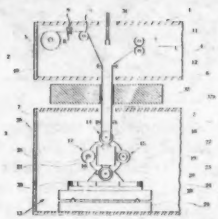
PCT No. PCT/JP86/00019, § 371 Date Sep. 17, 1986, § 102(e) Date Sep. 17, 1986, PCT Pub. No. WO86/04280, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 17, 1986, Ser. No. 919,005

Claims priority, application Japan, Jan. 17, 1985, 60-05056; Jan. 18, 1985, 60-05943; Feb. 8, 1985, 60-21793; Mar. 29, 1985, 60-63241; Apr. 11, 1985, 60-75361; Apr. 16, 1985, 60-79400

Int. Cl.[4] B23H *7/02, 7/10*

U.S. Cl. 219—69 W **20 Claims**



1. A wire-cut electric discharge machine comprising:

first and second vertically spaced working heads;

supply means on said first working head for a wire electrode;

collecting means on said first working head for collecting the wire electrode;

electrode returning means on said second working head for receiving the wire electrode from said supply means and for returning the wire electrode to said collecting means, said electrode returning means forming a loop in said wire electrode to provide a first segment thereof coming from the supply means and an adjacent second segment returning to the collecting means;

means supporting a workpiece between said heads;

said workpiece having an opening through which the first and second segments extend adjacent to one another in operative position for each to machine the workpiece;

means for providing relative movement between the workpiece and the segments of the wire electrode;

power means for supplying voltage pulses to said wire electrode for effecting electric discharge machining between the workpiece and the two segments of the wire electrode; and

means for supplying a working fluid into a working gap formed between the workpiece and the two adjacent segments of the wire electrode.

4,803,327

ELECTRICAL POWER FEEDER FOR A WIRE ELECTRODE TYPE ELECTRICAL DISCHARGE MACHINING APPARATUS

Haruki Obara, Sagamihara, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP87/00131, § 371 Date Dec. 4, 1987, § 102(e) Date Dec. 4, 1987, PCT Pub. No. WO87/05242, PCT Pub. Date Sep. 11, 1987

PCT Filed Mar. 3, 1987, Ser. No. 123,066

Claims priority, application Japan, Mar. 5, 1986, 61-49270

Int. Cl.[4] B23H *7/10*

U.S. Cl. 219—69 W **6 Claims**

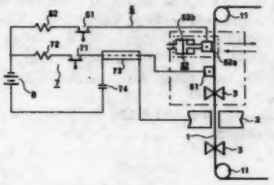
1. An electric power feeder for a wire electrode type electrical discharge machining apparatus having a wire electrode, said apparatus comprising:

a wire electrode guide for guiding a wire electrode;

first electric power supply means arranged along the wire

electrode for supplying a first machining power to the wire electrode; and

second electric power supply means, movably arranged to selectively connect with the wire electrode and disconnect the wire electrode from said first power supply means, for supplying a second machining power to the wire electrode so that the wire electrode is selectively contacted with either said first electric power supply means or said second electric power supply means.



4,803,328

WIRE GUIDE FOR ELECTRIC DISCHARGE WIRE CUTTING

Haruki Obara, Sagamihara, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

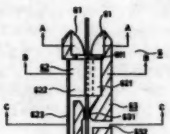
PCT No. PCT/JP86/00578, § 371 Date Sep. 14, 1987, § 102(e) Date Sep. 14, 1987, PCT Pub. No. WO87/02920, PCT Pub. Date May 21, 1987

PCT Filed Nov. 12, 1986, Ser. No. 85,406

Claims priority, application Japan, Nov. 14, 1985, 60-175827

Int. Cl.[4] B23H *7/10, 7/02*

U.S. Cl. 219—69 W **4 Claims**



1. A wire guide for guiding a wire electrode in a wire electrode type electrical discharge machining apparatus, said wire guide comprising:

an arc-shaped guide arranged at a guiding end of said wire guide;

a three-point-supporting guide arranged close to said arc-shaped guide in an end-to-end arrangement so that the wire electrode can pass therethrough; and

an external tube member for holding said arc-shaped guide and said three-point-supporting guide therein, said external tube member having a center opening at a non-guiding end of said wire guide for allowing the wire electrode to pass therethrough, and a cooling liquid supply opening for supplying a cooling liquid for cooling the wire electrode.

4,803,329

WELDER HEAD

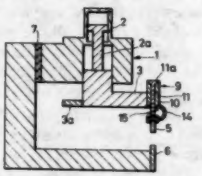
Syozo Nakata, Hyogo, and Satoshi Imai, Aichi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 89,804

Claims priority, application Japan, Aug. 27, 1986, 61-200947

Int. Cl.[4] B23K *9/32*

U.S. Cl. 219—86.25 **12 Claims**



1. A welder head, comprising:

a pair of welding electrodes arranged opposite to each other, workpieces to be welded being placed between said welding electrode;

an electrode holder including a sliding member for holding one of said welding electrodes and a support member for supporting said sliding member for slidable movement in a first direction;

a pressure mechanism for pressing said one of said welding electrodes toward the other of said welding electrodes;

an elastic member for urging said sliding member in said first direction; and

a flexible U-shaped electricity feeder having two legs provided between said one of said welding electrodes and said support member of said electrode holder with both legs surrounding said sliding member, for supplying a welding current to said one of said welding electrodes, wherein open ends of said U-shaped electricity feeder are separated from each other by electromagnetic forces generated by a current flowing through said U-shaped electricity feeder.

4,803,330

MACHINE FOR FLASH BUTT WELDING OF PIPES

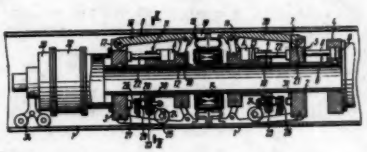
Sergei I. Kuchuk-Yatsenko; Vasily A. Sakharnov; Boris A. Galian, and Vladimir F. Zelensky, all of Kiev, U.S.S.R., assignors to Institut Elektrosvarki Imeni E.O. Patona Akademii Nak Ukrainskoi, Kiev, U.S.S.R.

PCT No. PCT/SU86/00024, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/05840, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 26, 1986, Ser. No. 156,919

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—97 **1 Claim**



1. A machine for flash butt welding of pipes which is located in the bore of the pipes (1) welded together and which comprises a housing (2) arranged coaxially with said pipes (1) welding together and provided with a first supporting disc (3) and a second supporting disc (4) which are fitted to said housing at the opposite ends thereof; a pipe flashing-and-upsetting

means (5) with a hydraulic actuator (6) serving to displace same along the axis of the housing 2, a carrier (7) of said means being located on the housing (2) of the machine next to the second supporting disc (4); two pipe clamping means (9, 10) with individual hydraulic actuators (11) for displacing same along the axis of the housing, carriers (12, 13) of pipe clamping means being located on the housing (2) between the first supporting disc (3) and the carrier (7) of the pipe flashing-and-upsetting means characterized in that bellcranks (24) pivotally attached to the outside surface of each carrier (12, 13) of the pipe clamping means (9, 10) are provided at least at three points spaced equidistantly apart all the way around the periphery of each carrier (12, 13) with provision for rocking in the radial direction about fulcrum pins (23) and rigid stops (27, 31) are provided on the first supporting disk (3) and on that side of the carrier (7) of the pipe flashing-and-upsetting means (5) which faces the pipe clamping means (9, 10) whereby every bellcrank (24) is fitted with provision for interacting at one side (26) of its free end with one of the rigid stops (27, 31) which equal the bellcranks (24) in number and at the other side (28) of the end, with a spring-loaded stop (29) provided on the carrier (12, 13) of every pipe clamping means (9, 10) and the opposite end of every bellcrank (24) is fitted with an aligning roller (25) contacting the inner wall of the pipes (1) welded together.

4,803,331

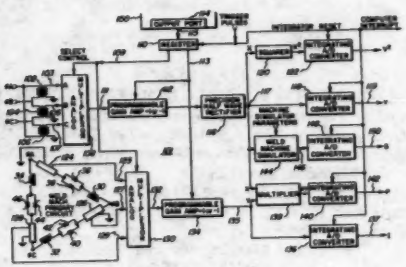
POWER CONTROL AND LINE VOLTAGE MONITOR/COMPENSATOR FOR RESISTANCE SPOT WELDING MACHINES

Robert K. Cohen, 244 Hansen Ave., Albany, N.Y. 12208

Filed Jan. 28, 1987, Ser. No. 7,940

Int. Cl.[4] B23K *11/24*

U.S. Cl. 219—110 **33 Claims**



1. A method for pulse-by-pulse monitoring of variations in multi-phase AC input line power applied as sequential power pulses to a load through selectively triggered thyristor type devices of a power control, comprising the steps of:

monitoring a function of each of the multi-phase AC input line signals to the thyristor type devices, the function comprising one of current and voltage;

synthesizing from the monitored function, during the operation of the thyristor type devices, a first replica signal replicating the composite function passed to the load by the thyristor type devices, the commutation effect of the thyristor type devices being replicated in synthesizing the first replica signal; and

processing the first replica signal to produce an independent measurement of a circuit parameter for each individual power pulse.

4,803,332

APPARATUS FOR PLASMA TREATMENT OF A SHEET-LIKE STRUCTURE

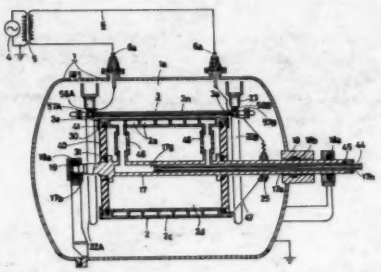
Motoyasu Koyama, Kurashiki; Hidetoshi Teraoka, Soja; Takao Akagi; Shinji Yamaguchi, both of Kurashiki; Itsuki Sakamoto, Hiroshima; Akira Namba, and Isao Okagaki, both of Okayama, all of Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

Filed Jun. 5, 1987, Ser. No. 58,858

Claims priority, application Japan, Jun. 10, 1986, 61-134067; Jun. 11, 1986, 61-135579

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121.52 **15 Claims**



1. A plasma treating apparatus for treating a sheet-like structure comprising:

a substantially drum-shaped first discharge electrode assembly;

a rotary shaft, rigidly connected to said first discharge electrode assembly, for rotating said first discharge electrode assembly;

a vacuum vessel surrounding said first discharge electrode assembly;

said rotary shaft extending through said vacuum vessel;

said sheet-like structure arranged about an outer periphery of said first discharge electrode assembly;

a second discharge electrode assembly, disposed within said vacuum vessel and confronting said first discharge electrode assembly;

an electric circuit for supplying electric power to said first and second discharge electrode assembly;

first insulating members for insulating electrically said vacuum vessel from said electric circuit; and

second insulating members for electrically insulating the drum of said first discharge electrode assembly from said rotary shaft.

4,803,333

VIEWING OPTICS FOR EXTERNAL-MOUNT ELECTRON BEAM WELDERS

Glen S. Lawrence, Naperville; Timothy J. Haynie, Hickory Hills; Joseph D. Ferrario, LaGrange, and Stefan P. Kyselica, Willow Springs, all of Ill., assignors to Ferranti Sciaky, Inc., Chicago, Ill.

Filed Apr. 6, 1988, Ser. No. 178,363

Int. Cl.[4] B23K *15/00*

U.S. Cl. 219—121.13 **7 Claims**

1. In an electron beam welding machine consisting of: a vacuum chamber; an electron beam gun mounted upon said vacuum chamber; a means for directing an electron beam along a path from said electron beam gun to the inside of said chamber; a carriage mounted within said chamber and movable along two mutually perpendicular axes; a means for mounting on said carriage, workpieces to be welded along a seam by said electron beam; and an optical system mounted on said machine

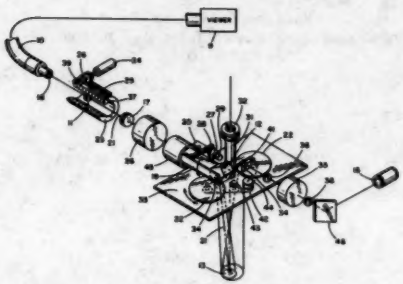
for viewing, from outside the chamber, the area to be welded on said workpieces, the said optical system comprising:

a telescope including an objective and a focusing lens system, arranged along an optical axis which is perpendicular to the path of said electron beam and passes through the center of the said lens system;

a pentaprism for bending the optic axis by 90 degrees mounted along the said optic axis, between the said objective lens and the path of the said electron beam;

a means for supporting and rotating the said pentaprism in a plane perpendicular to said optic axis;

a coherent fiber optics bundle having one end centered along the optic path and adjacent to the said focusing lens;



a means for moving said focusing lens along the optic path so as to project the image of a desired area on a workpiece upon which the said electron beam can impinge;

a means cooperating with the said means for moving said focusing lens for automatically rotating the said pentaprism in said plane so that it views an area on the workpiece upon which the said electron beam impinges, and which area is projected in sharp focus onto the said first end of the fiber optics bundle;

and means for viewing the image which is transmitted to the opposite end of the fiber optics bundle.

4,803,334

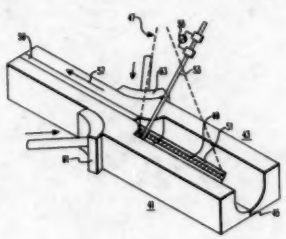
METHOD FOR LASER BEAM WELDING METAL MATRIX COMPOSITE COMPONENTS

Michael A. Burke, Pittsburgh, and Gerald G. Leumann, Pleasant Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1987, Ser. No. 121,814

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.64 **17 Claims**



1. The method of producing a conduction weld between first and second metal matrix composite components with a metal matrix composite material comprising:

placing first and second metal matrix composite components into abutting relationship to form an intersection between a portion thereof along which said components are to be joined, with a major portion of said metal matrix composite components spaced from each other;

directing a laser beam through said spacing in the area of said intersection and oscillating said beam across said intersection and alternately onto each of said spaced portions of said first and second components to produce a conduction weld therebetween with a shallow pool of metal matrix composite;

feeding a filler wire composed of a metal matrix composite into said pool, such that the volume of the melted matrix composite material from the two components is less than the volume of the metal matrix composite added thereto; and

moving said laser beam and filler wire along said intersection such that solidification of the molten pool containing said filler wire metal matrix composite is effected to form a weld line without separation of the metal matrix composite into separate phases, so as to produce a substantially homogenous metal matrix composite weld between said first and second metal matrix composite components.

4,803,335

GAS SHROUD AND METHOD

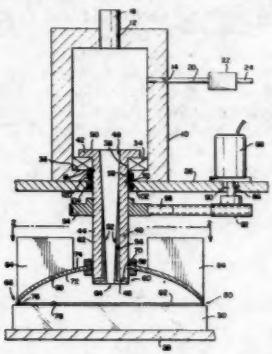
William M. Steen, Surrey, Great Britain, and Vijitha M. Weerasinghe, London, England, assignors to Quantum Laser Corporation, Edison, N.J.

Filed Jun. 2, 1987, Ser. No. 56,771

Claims priority, application European Pat. Off., Jan. 7, 1987, 87300086.3

Int. Cl.[4] B23K *26/14*

U.S. Cl. 219—121.84 **41 Claims**



1. A workpiece shroud, comprising:

(a) chamber means including a beam inlet, a fluid inlet and an outlet portion;

(b) shield means operably associated with said outlet portion and being rotatable relative to said chamber means;

(c) drive means operably associated with said shield means for rotating said shield means; and,

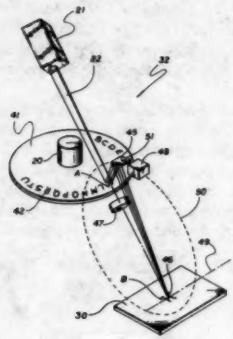
(d) diverter means operably associated with said shield means and rotatable therewith so that rotation of said diverter means causes a radially outwardly directed gas flow preventing the environment surrounding said shield means from entering said shield means.

4,803,336

HIGH SPEED LASER MARKING SYSTEM

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 14, 1988, Ser. No. 143,867
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.68 13 Claims



1. A high speed system for marking a symbol or group of symbols on a target, said system comprising:

laser means for generating a beam of electromagnetic energy and

symbol generating means for forming the image of a symbol on a target, said symbol generating means including:

reflective means for reflecting said beam of energy to form said image on said target, said reflective means including means for generating a plurality of symbols, and

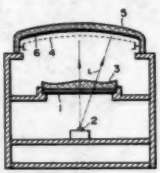
means for selecting one of said plurality of symbols to be generated by said reflective means.

4,803,337

METHOD FOR PRODUCING A LIGHT TRANSMITTING FILTER

Reiji Ishikawa, and Tomohiro Kimura, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 673,728, Nov. 21, 1984, abandoned.
This application Nov. 25, 1987, Ser. No. 125,828
Claims priority, application Japan, Nov. 28, 1983, 58-223894
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.85 9 Claims



1. A method of producing a selective light transmitting filter for illuminance correction purposes in an exposure device adaptive for producing a phosphor screen of a cathode ray tube, comprising the steps of:

forming an opaque layer of heat mode optical recording material on a flat transparent base plate;

modulating a laser beam by an optical modulator operated by voltage pulses a pulse width or period of repetition of which is preset by the pattern to be formed in said layer; and

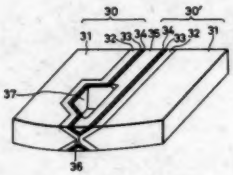
irradiating and applying said pulses of said modulated laser beam on said layer while moving said beam plate in perpendicular directions in the same plane for evaporating selected desired portions of said layer to produce a predetermined, varying pattern of light transmitting throughholes in said layer on said base plate in accordance with said predetermined light transmittance pattern.

4,803,338

MAGNETIC HEAD HAVING IMPROVED TRACK WIDTH NARROWING GROOVES

Noriyuki Kumasaka, Ohme; Shigekazu Otomo, Sayama; Takeo Yamashita, Tachikawa; Hideo Zama, and Juichi Morikawa, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1987, Ser. No. 777
Claims priority, application Japan, Jan. 10, 1986, 61-2008
Int. Cl.[4] G11B *5/22, 5/25*
U.S. Cl. 360—122 19 Claims



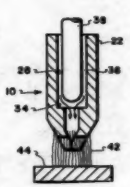
1. In a magnetic head having a metallic ferromagnetic material at a portion of said magnetic head which defines a transducing gap, and having track width narrowing grooves filled with a first glass over said metallic ferromagnetic material; a magnetic head characterized in that an oxide film or carbide film is provided on said metallic ferromagnetic material, a nonmagnetic metal film is provided on said oxide film or said carbide film, and said first glass is packed on said nonmagnetic metal film.

4,803,339

HOLLOW ELECTRODE AND ARC INITIATION METHOD

Stephen S. Gordon, Moorpark; Gerald E. Dyer, Canoga Park, both of Calif., and Lee A. Flanigan, Harvest, Ala., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 16, 1987, Ser. No. 97,233
Int. Cl.[4] B23K *35/04*
U.S. Cl. 219—145.21 4 Claims



1. A hollow electrode for use in an inert gas arc welding apparatus comprising:

(1) an electrically conductive cylindrical body having a proximate end and a working end;

(2) a first cylindrical throughbore originating at the proximate end and extending into the cylindrical body said first throughbore including a plunger movably retained within the first throughbore;

(3) a second cylindrical throughbore terminating at the working end and having an interior diameter of less than the first throughbore;
(4) a step including surface areas defining a juncture of the first and second throughbores;
(5) a passageway defined by the throughbores and extending into and through the electrode for conveying a working gas; and
(6) an electrode face forming a terminus at the working end of the hollow electrode and further comprising a lune-shaped radial surface and two tapered intersecting cone-shaped angled surfaces.

4,803,340

COVERED ARC-WELDING ELECTRODE

Kouki Sato; Junya Matsuyama, and Noboru Nishiyama, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Hyogo, Japan

Filed Apr. 20, 1987, Ser. No. 40,343
Claims priority, application Japan, Apr. 23, 1986, 61-92269; Jul. 25, 1986, 61-173574
Int. Cl.[4] B23K *35/22*
U.S. Cl. 219—146.1 **8 Claims**

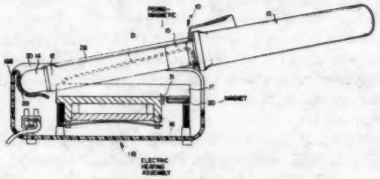
1. A covered arc welding electrode comprising:
a flux including 40 to 60% metal carbonate, 10 to 25% metal fluoride and 4 to 25% metal oxide by weight; and
a steel core wire, onto the outer periphery of which said flux is applied so as to comprise 24 to 32% of the total weight of said electrode,
said electrode as a whole being comprised of 0.005 to 0.05% carbon, 0.1 to 1.1% silicon, 1.5 to 2.5% manganese, not more than 0.007% sulfur and not more than 0.25% nickel by weight and in which the manganese/sulfur ratio is more than or equal to 350 to 1.

4,803,341

CORDLESS CURLING IRON WITH SEPARATE ELECTRIC HEATING STATION

Karlheinz Barowski, Hattersheim, and Günter Helbig, Mörfelden-Walldorf, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

PCT No. PCT/DE86/00397, § 371 Date Jun. 19, 1987, § 102(e) Date Jun. 19, 1987, PCT Pub. No. WO87/02555, PCT Pub. Date May 7, 1987
PCT Filed Sep. 26, 1986, Ser. No. 71,280
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538545
Int. Cl.[4] H05B *1/02*; A45D *4/16, 2/36*
U.S. Cl. 219—222 **7 Claims**



1. An indirectly heatable curling iron and heating station comprising
a curling iron (10) having an elongated curling mandrel (12),
a separate heating station (11) which includes a heating assembly (18) having a cradle (17) for removably receiving said curling mandrel (12) of the curling iron for heating the mandrel (12) to a desired temperature prior to use, said cradle (17) providing direct intimate thermal contact between said mandrel (12) and the heating assembly when the mandrel (12) is inserted therein,
said curling iron (10) and heating station (11) including
means for producing first and second force components of relatively opposite direction and acting upon said mandrel (12) of the curling iron (10) when inserted into the cradle (17) of the heating assembly (18) of the heating station (11),
such that the first force component causes disengagement of the curling mandrel (12) from the heating assembly (18) to break intimate thermal contact therebetween while the second force component causes the curling mandrel (12) to engage the heating assembly (18) to establish said intimate thermal contact,
said means for producing the second component of force comprising a permanent magnet (20) arranged in the lateral boundary area of the cradle (17) of the heating assembly (18) and a ferromagnetic body (15) arranged on the curling mandrel (12) of the curling iron (10), the Curie point of the ferromagnetic body (15) corresponding substantially to the desired temperature of the curling mandrel (12),
said permanent magnet being embedded in a recess of said heating station (11) and said permanent magnet (20) and said ferromagnetic body (15) lying opposite each other when the curling mandrel (12) is inserted into the cradle (17) of the heating assembly, such that no direct contact exists between said permanent magnet and said ferromagnetic body (15),
the second force component varying in dependence upon the temperature of the curling mandrel (12), such that for temperatures of the curling mandrel (12), below a selected desired value, the value of the second force component exceeds the value of the first force component,
while for temperatures of the curling mandrel (12) above the adjustable desired value, the value of the first force component exceeds the value of the second force component, and that the temperature of the heating assembly (18) is set to a value above the desired temperature of the curling mandrel.

4,803,342

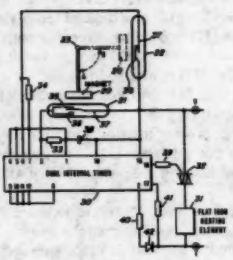
FLAT-IRON SAFETY DEVICE UTILIZING A DUAL INTERNAL TIMING CIRCUIT

Michel Steers, La Queue en Brie; Michel Courdille, and Jean-Pierre Hazan, both of Sucy en Brie, all of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Dec. 3, 1986, Ser. No. 937,597
Claims priority, application France, Dec. 6, 1985, 8518102
Int. Cl.[4] H05B *1/02*; D06F *75/26*
U.S. Cl. 219—257 **7 Claims**

1. A safety device for controlling the supply of heating current to an electric flat iron comprising a movable permanent magnet adapted to be positioned in an iron and arranged for movement in a substantially horizontal direction in response to the iron being moved during ironing and actuating a first switch controlling a first timing circuit for causing the heating current supply of the iron to be interrupted in response to said permanent magnet having been motionless in said horizontal position for a predetermined time interval, characterized in that said first timing circuit is arranged to cause the power supply to be interrupted after a first predetermined time interval shorter than the time taken by the iron to reach its normal operating temperature and in that said movable permanent magnet actuates a second switch in response to the flat-iron being brought into a substantially vertical warming-up or waiting position, said second switch controlling another timing

circuit to cause the heating current supply to the iron to be interrupted after a second predetermined time interval of non-



use in said vertical position longer than the time taken by the iron to reach its normal operating temperature.

4,803,343

ELECTRIC FLUID HEATING APPARATUS UTILIZING A VAPORIZABLE WORKING FLUID

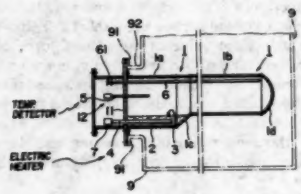
Junji Sotani, Yokohama; Tatsuya Koizumi; Shiro Endo, both of Tokyo; Nobuyoshi Mashino, Hidaka, and Susumu Seo, Yokohama, all of Japan, assignors to The Furukawa Electric Co., Ltd. and The Furukawa Construction Co., Ltd., both of Tokyo, Japan

Filed Dec. 23, 1986, Ser. No. 945,716

Claims priority, application Japan, Dec. 26, 1985, 60-297183; Mar. 20, 1986, 61-63333; Mar. 20, 1986, 61-63334

Int. Cl.[4] H05B *3/82*; F28D *15/02*; F22B *1/28*; F24H *1/20*

U.S. Cl. 219—326 **5 Claims**



1. A heating apparatus comprising:

(a) an elongated tubular receiver having a cover plate affixed to one end thereof, said receiver being positioned substantially horizontally;

(b) an electric cartridge heater inserted into a lower portion of said receiver through said cover plate;

(c) a vaporizable working fluid partially filling the lower portion of said tubular receiver to a level sufficient to cover said cartridge heater;

(d) a temperature detector inserted into said receiver through said cover plate at a location above the level of said working fluid;

(e) a sealed tubular heat exchange means in communication with said receiver through a single passage through which the vaporized working fluid flows from the receiver into the tubular heat exchange means and through which condensed working fluid from the tubular heat exchange means is returned to the receiver, said tubular heat exchange means having a surface in contact with a fluid to be heated;

(f) means for evacuating said sealed tubular heat exchange means and said receiver; and

(g) means for energizing said cartridge heater in response to the temperature detected by said temperature detector;

wherein said working fluid transfers heat from said cartridge heater to said fluid to be heated by evaporation at said receiver and condensation on the surface of said sealed tubular heat exchange means.

4,803,344

APPARATUS AND PROCESS FOR CONTROLLING THE SIMMERING OR COOKING TIME IN A COOKING VESSEL

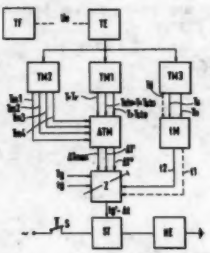
Kurt Wolf, and Wolfram K. Andre, both of Wildbad, Fed. Rep. of Germany, assignors to Fissler GmbH, Fed. Rep. of Germany

Filed Dec. 9, 1987, Ser. No. 130,784

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1987, 3642181

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—497 **20 Claims**



1. An apparatus for controlling a simmering or cooking time in a cooking vessel which is heated by means of an electrical cooking plate with a control circuit, comprising:

means for measuring a starting temperature (Tx) upon switching on said cooking plate;

means for determining a rate of increase (ΔT) of a temperature (T)in each of a plurality of "n" successive temperature measuring ranges (Tm1 to Tmn) in a heating phase below the temperature (Td) necessary for initiating significant steam formation producing "n" successive measured values (ΔT, ΔT2, ΔTn);

means for measuring a rate of increase (ΔT') of said temperature (T) only determined from "k" measuring values, wherein "k" is less than "n", and has the steepest rate of increase in temperature rise when said starting temperature (Tx) is lower than a set lower temperature boundary value (Tstu);

means for measuring a rate of increase (ΔT') of said temperature (T) determined from "m" measuring values, wherein "m" is less than "k", when said starting temperature (Tx) is greater than said lower temperature boundary value (Tstu), but less than an upper temperature boundary value (Tsto);

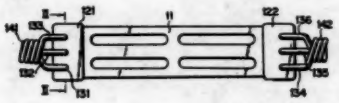
means for measuring a time period (t2) from reaching a boiling temperature (Ts) of water up to the reaching of a predetermined measuring temperature (Tn) lying slightly above said boiling temperature (Ts) when said starting temperature (Tx) is greater than said upper temperature boundary value (tsto); and

means for the premature switching off said cooking plate prior to a set cooking or simmering time a premature time period (Δt) derived from said rates of increase (ΔT, ΔT', ΔT'') of said temperature (T) and said measured time period (t2), whereby said premature time period (Δt) is greater the slower said rates of increase (ΔT, ΔT', ΔT'') of said temperature (T) and generally proportionately greater the longer said time period (t2).

4,803,345
CERAMIC HEATER APPARATUS WITH METAL ELECTRODES

Hiroki Hoshizaki, Anjo; Kazuo Oyobe, Oobe; Hirofumi Suzuki, Kariya; Nobuaki Kawahara, Anjo; Hitoshi Niwa, Okazaki, and Terutaka Kageyama, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 10, 1987, Ser. No. 72,226
Claims priority, application Japan, Jul. 11, 1986, 61-163119; May 19, 1987, 62-119996
Int. Cl.[4] H05B 3/10
U.S. Cl. 219—553 22 Claims

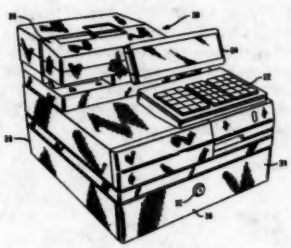


1. A ceramic heater apparatus having metal electrodes, comprising:
- a heater body formed of a ceramic material and having electrode attaching ends for supplying power for heating;
- means defining an opening respectively in each of the electrode attaching ends of the ceramic heater body;
- a metallized layer formed at least on the inner periphral surface of each of said openings;
- a metal electrode inserted in each of the openings on the inner peripheral surface of which the metallized layer is formed; and
- a brazing material filled, in a molten state, in a clearance between the metallized layer and the metal electrode to bond them together.

4,803,346
THEFT PROOF CASH DRAWER ASSEMBLY

Dale R. Lyons; David C. Wills, and George Heys, Jr., all of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed May 6, 1988, Ser. No. 190,808
Int. Cl.[4] G06C 5/00
U.S. Cl. 235—7 R 7 Claims

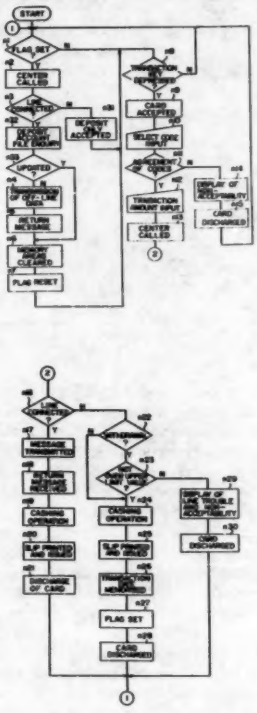


1. A data terminal device having a plurality of depending engaging members extending from a lower surface thereof;
- a support member including a plurality of apertures for receiving said engaging members for slidably supporting said terminal device for movement to a locking position on said support member;
- a cash drawer member slidably mounted within said support member for movement between an open and closed position; and
- a plurality of depending stop members secured to the lower surface of the terminal device and located adjacent a rear of the cash drawer when in a closed position whereby the cash drawer member engages the stop members to block the movement of the terminal device when moved in an unlocking direction on said support member.

4,803,347
AUTOMATIC TRANSACTION MACHINE

Youji Sugahara, Otsu, and Hideyuki Matsumura, Shiga, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 25, 1987, Ser. No. 29,895
Claims priority, application Japan, Mar. 25, 1986, 61-67677
Int. Cl.[4] G06F 15/30
U.S. Cl. 235—379 8 Claims



1. An automatic transaction machine for executing customer transactions and communicating with a central station, said machine comprising:
- means for receiving identifying data identifying a customer;
- means for receiving a transaction amount;
- means for receiving information concerning a desired transaction;
- means for initiating an on-line transaction communication with said central station over a communications link;
- means responsive to establishment of said on-line transaction communication with a central station for transmitting data including at least said identifying data and transaction amount over said communications link to said central station for updating an account file corresponding to said identificant data thereat;
- means responsive to a first signal received from said central station indicating an updating of said account file for completing said desired transaction on-line;
- means responsive to an absence of an on-line communication with said central station, after said on-line communication

is initiated, for completing said desired transaction off-line; and

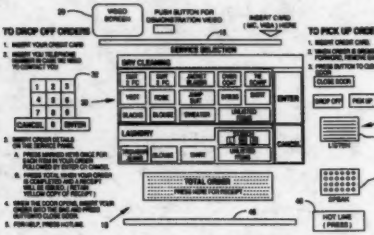
an off-line transaction memory means operative when said machine completes said desired transaction off-line for storing data concerning a completed off-line transaction for later transmission to said central station.

4,803,348

AUTOMATED CUSTOMER INTERFACE FOR SERVICES INVOLVING DROP-OFF AND PICKUP

David W. Lohrey, 339 Golden Gate Ave., Belvedere, Calif. 94920, and Alexander R. Danel, 660 Berkeley Ave., Menlo Park, Calif. 94025

Filed Jun. 30, 1987, Ser. No. 68,198
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—381 **39 Claims**



1. A system for automated drop-off and pickup of laundry and dry cleaning orders, remote from a central dry cleaning-/laundry plant, for unattended use by customers, comprising:

a storage facility for garment bags, soiled garments of unprocessed orders and processed laundry/dry cleaning orders, including means for storing garment bags and processed orders in positions for retrieval,

a customer interface panel at the front of the storage facility,

retrieval means in the storage facility for retrieving a garment bag or a processed order upon receipt of an appropriate command,

the customer interface panel including card reader means for reading encoded information on a customer's non-dedicated general purpose credit card, display means for presenting information and instructions to the customer, menu means for displaying to the customer a menu of services for selection for the customer's order, customer input means for enabling the customer to select desired services from the menu of services in accordance with the items the customer is dropping off, and printer means for printing and outputting to the customer a receipt reflecting the services selected by the customer on the customer input means,

a door adjacent to the interface panel between the customer's position and the storage facility, including door opening and closing means,

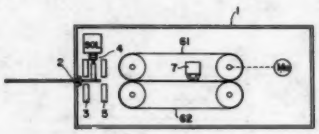
computer means including memory means, for issuing appropriate instructions to the customer on the display means after receiving information from the customer's credit card; for receiving the customer's input on the input means; for issuing a command to the retrieval means if the customer's order has been processed and placed in the storage means, to go to a particular storage position in the storage facility to retrieve the processed order and bring it to the door and open the door to enable the customer to remove the processed order; for creating and storing a transaction record of each transaction; and for driving the printer means and other functions.

4,803,349

CARD READ/WRITE DEVICE

Osamu Sugimoto, Iruma, and Masayuki Watabe, Wako, both of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Dec. 2, 1986, Ser. No. 937,065
Claims priority, application Japan, Dec. 5, 1985, 60-187578[U]
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—475 **4 Claims**



1. A card read/write device comprising:

an inlet sensor disposed at a card insertion inlet of a card transportation passage;

a shutter which is disposed adjacent to said card insertion sensor and opens in response to a detection signal from said inlet sensor;

a transportation mechanism driving sensor disposed in said card transportation passage backwardly of said shutter;

a card transportation mechanism disposed in said card transportation passage backwardly of said shutter for transporting the inserted card backwardly; and

card information read/write means disposed in said card transportation mechanism,

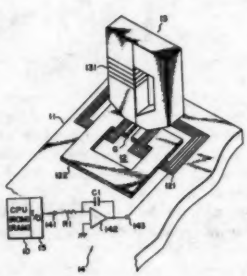
whereby when the trailing edge of the card passes through said transportation mechanism driving sensor in the case of returning the card, said card transportation mechanism is deactivated and when said transportation mechanism driving sensor is turned on again by the card pushed towards backward after staying in said card transportation mechanism, said card transporting mechanism is activated again to transport the card towards said card information read/write means so that the read/write operation of the card is carried out.

4,803,350

NON-CONTACT READING TYPE IC CARD WITH PRE-ENHANCEMENT FUNCTION

Fumio Izawa, Sagamihara, and Masayuki Shinozaki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 28, 1988, Ser. No. 149,592
Claims priority, application Japan, Feb. 3, 1987, 62-21697
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 **20 Claims**



1. An IC card comprising:

a card substrate;

an IC element incorporated in said card substrate, said IC element including at least a memory in which data can be stored and from which data can be read out;

pre-processing means, incorporated in said card substrate, for receiving an output from said IC element, said pre-processing means pre-enhancing readout data from said memory of said IC element, to substantially attenuate a high-frequency component; and

transducer means, incorporated in said card substrate, for receiving an output from said pre-processing means, said transducer means generating a magnetic field corresponding to the readout data supplied from said memory of said IC element via said pre-processing means.

4,803,351

IC CARD SYSTEM WITH CONTROL OF DATA-WRITING PROCESS

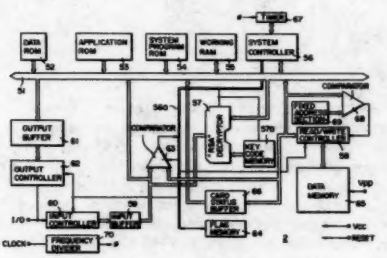
Yoshimi Shigenaga, Higashiyamato, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1987, Ser. No. 21,341

Claims priority, application Japan, Mar. 12, 1986, 61-54454

Int. Cl.[4] G06K 5/00

U.S. Cl. 235—492 **7 Claims**



1. An IC card system comprising:

IC card means including at least one integrated circuit having a nonvolatile memory for storing data; and

card terminal means for writing data into said IC card means when said IC card means is electrically coupled to it;

said card terminal means including:

time-measuring means for measuring a predetermined period of time;

power-supply means for supplying data-writing power to said nonvolatile memory provided within said IC card means while said time-measuring means is measuring said predetermined period of time;

detecting means for detecting a response from said IC card means; and

control means coupled to said power supply means and including means for initializing said time-measuring means when said detecting means detects said response from said IC card means, in order to supply said data-writing power from said power-supply means to said nonvolatile memory, and further including means for turning off said power-supply means when said time-measuring means finishes measuring said predetermined period of time, as a result of no response from said IC card means to said detecting means.

4,803,352

AUTOFOCUSING SYSTEM FOR A MICROSCOPE AND METHOD OF USING THE SAME

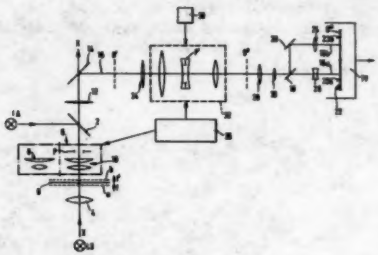
Fritz Bierleutgeb, Rottstrasse 16/19, A-1140 Wien, Austria

Filed May 14, 1987, Ser. No. 50,267

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616544; Mar. 9, 1987, 3707487

Int. Cl.[4] G01J 1/20

U.S. Cl. 250—201 **20 Claims**



5. An autofocusing system for a variable power microscope having an imaging system, including an objective, for providing a magnified image from light received from an object, a focusing mechanism and means to direct a portion of the image-producing light from the objective to said autofocusing system, which comprises a beam divider to direct said portion along two paths, imaging optics located on each path, electro-optical means to convert light from said imaging optics into two electrical signals, each of said signals having one characteristic varying inversely to the one characteristic of the other as the microscope focus changes, means to modify said signals when the magnification is changed, and control means to drive the focusing mechanism in response to said signal, whereby deleterious effects of changes in magnification are reduced.

4,803,353

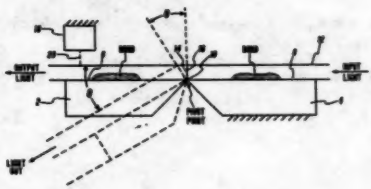
LIGHT ATTENUATION MOTION TRANSDUCER WHEREIN TWO FIBER OPTIC CABLES ABUT AT THE PIVOT AXIS OF PIVOTABLE MOUNTING MEMBERS

Robert M. Moorehead, 202 Hyde Park, Richardson, Tex. 75080

Filed Mar. 24, 1988, Ser. No. 172,367

Int. Cl.[4] H01J 5/16; G01D 5/34

U.S. Cl. 250—227 **5 Claims**



1. A transducer for converting linear motion into a predictable variation in the light attenuation characteristic of a fiber optic cable comprising; a fiber optic cable circumferentially severed with respective severed ends abuttable to effect a minimum attenuation of light being transmitted therethrough; an input coupling arm member, and means responsive to a linear motion of said input coupling arm member for effecting a variable angular relationship between the longitudinal axes of respective abutted severed ends of said cable by rotation of at least one of said abuttable pair of said severed cable ends about an axis lying in the plane defined by that abuttable pair of said

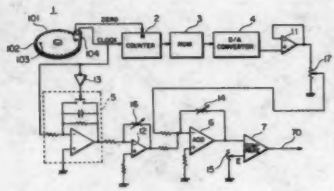
severed cable ends and tangent to a radius common to each pair of said abuttable severed cable ends.

4,803,354

CIRCUIT FOR CORRECTING OUTPUT PHASE OF ROTARY ENCODER

Yoichi Onodera, Hachioji; Hideyuki Horiuchi, Abiko, and Chiaki Shimbo, Mitaka, all of Japan, assignors to Hitachi Medical Corp., Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,482
Claims priority, application Japan, Apr. 9, 1986, 61-82643
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **8 Claims**



1. A circuit for correcting the output phase of a rotary encoder which delivers a train of output pulses representing the rotation angles of a rotating disc detected by a light detector, said circuit comprising:

correction data storing means for storing therein data for correction of an error caused by a variation in position of said rotary encoder; and

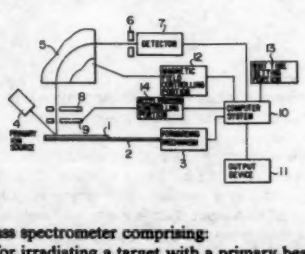
phase modulating means for phase-modulating the output pulses of said rotary encoder on the basis of the correction data outputted from said correction data storing means, wherein said phase modulating means produces the sum of an integrated value of the output pulses of said rotary encoder and a digital-to-analog converted value of the correction data of said correction data storing means and compares a value of the produced sum with a predetermined reference value to produce a rectangular waveform having a duration from a point of time at which the sum value reaches said predetermined reference value to a point of time at which the sum value becomes to be below said predetermined reference value.

4,803,355

MASS SPECTROMETER

Sadao Takahashi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,179
Claims priority, application Japan, Mar. 26, 1986, 61-65708
Int. Cl.[4] H01J *49/04*
U.S. Cl. 250—288 **6 Claims**



1. A mass spectrometer comprising:

means for irradiating a target with a primary beam;

means for forwarding said target from outside of a vacuum chamber;

means for analyzing the mass of secondary ions emitted by said target;

means for collecting data on the secondary ions thus mass-analyzed; and

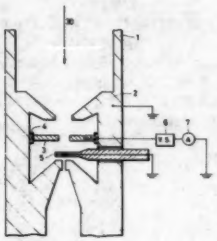
means for synchronizing the timing for the forwarding of said target and that for the data collection and for stopping substantially the data collection during a predetermined period of time (T) after stopping of the forwarding of said target.

4,803,356

METHOD AND APPARATUS FOR MEASURING DEGREE OF VACUUM IN AN ELECTRON MICROSCOPE

Hiroki Kumahora; Tsuneyuki Hashimoto, both of Hitachi, and Eiichi Nishimura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,549
Claims priority, application Japan, Jul. 7, 1986, 61-157833
Int. Cl.[4] G21K *1/00*
U.S. Cl. 250—306 **10 Claims**



1. A measuring method for degree of vacuum in an electron microscope, wherein an electrode group consisting of an anode and cathodes provided on both sides of the anode is disposed at a portion where the degree of vacuum in the electron microscope is to be measured, comprising the steps of generating thermal electrons by colliding an electron beam with said cathodes, closing in the thermal electrons between said electrode group utilizing a magnetic field forming a lens system of said electron microscope, collecting a gas ionized by the thermal electrons closed therebetween and measuring an ionic current so as to obtain the degree of vacuum.

4,803,357

METHOD AND ARRANGEMENT FOR DETECTING SECONDARY PARTICLES TRIGGERED ON A SPECIMEN BY A PRIMARY PARTICLE BEAM

Hans-Detlef Brust, Dudweiler, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

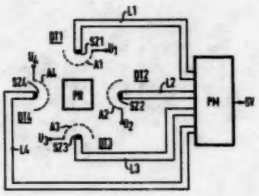
Filed Jan. 27, 1987, Ser. No. 6,993
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1986, 3602366
Int. Cl.[4] G01N *23/00*; H01J *3/14*
U.S. Cl. 250—310 **18 Claims**

1. A method for detecting secondary particles triggered on a specimen by a primary beam using a detector having at least one region sensitive to the secondary particles and a plurality of electrodes chargeable with voltages for deflecting and accelerating the secondary particles in the direction of the sensitive regions, the method comprising:

driving said individual electrodes with time dependent voltages of identical frequency;

phase-shifting said voltages supplied to said electrode arrangements so that a field rotating with a fixed sense is generated having a rotational frequency corresponding to

the frequency of the voltages applied to the individual electrode arrangements, said rotating field causing successive deflections of the secondary particles in the direction of the individual sensitive regions; and



selecting a rotation time for said field at most equal to the dwell time of the primary particle beam on the measuring point of the specimen.

4,803,358

SCANNING ELECTRON MICROSCOPE

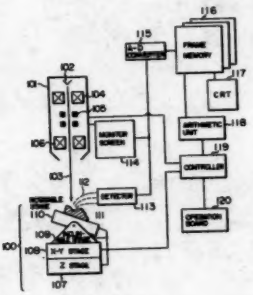
Makoto Kato, Kawasaki; Koichi Homma; Fuminobu Komura, both of Yokohama, and Toshihiro Furuya, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,599

Claims priority, application Japan, Mar. 18, 1987, 62-61020

Int. Cl.[4] H01J 37/20

U.S. Cl. 250—310 **6 Claims**



1. A scanning electron microscope for scanning the surface of a specimen with an electron beam to detect a signal emitting from the specimen, thereby forming an image of the surface of the specimen, the scanning electron microscope comprising:

a specimen table capable of making a vertical movement, a horizontal movement, a rotating operation and a tilting operation;

arithmetic means for converting the emitted signal into a digital signal to store the digital signal, and for calculating the amount of each of the vertical movement, horizontal movement, rotating operation and tilting operation of the specimen table, on the basis of the stored information, information on the present state of the specimen table, operating conditions of the scanning electron microscope and an indication given from the outside; and

a controller for controlling the specimen table on the basis of a calculated value from the arithmetic means.

4,803,359

METHOD FOR DETECTING RADIATION IMAGE

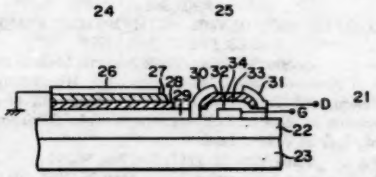
Yuichi Hosoi, and Junji Miyahara, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 15, 1984, Ser. No. 610,582

Claims priority, application Japan, May 16, 1983, 58-86226; May 16, 1983, 58-86227

Int. Cl.[4] G03C 5/16

U.S. Cl. 250—327.2 **7 Claims**



1. A method for detecting radiation image which comprises the steps of:

causing a radiation image storage panel which comprises a phosphor layer containing a stimulable phosphor to absorb a radiation having passed through an object or radiated from an object;

providing a photosensor composed of numerous photosensitive elements in regular and two-dimensional arrangement;

arranging said radiation image storage panel and said photosensor adjacent to each other in the form of layers;

irradiating the panel with an electromagnetic wave to release the radiation energy stored in the panel as stimulated emission; and

photoelectrically detecting the stimulated emission with said photosensor.

4,803,360

INFRARED RADIATION DETECTOR WITH FLANGED SEMICONDUCTOR WINDOW

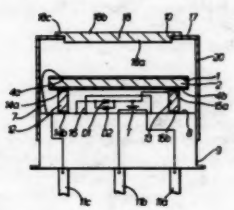
Patrick J. R. Ball, Southampton, and David N. Vaughan, Totton, both of England, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 21,565, Mar. 2, 1987, which is a continuation of Ser. No. 766,177, Aug. 15, 1985. This application Sep. 25, 1987, Ser. No. 102,309

Claims priority, application United Kingdom, Sep. 19, 1984, 8423689

Int. Cl.[4] G01J 5/08

U.S. Cl. 250—338.3 **5 Claims**



1. An infrared radiation detector comprising:

a canister having an inwardly directed flange defining an aperture in the canister;

a pyroelectric detector element in the canister; and

a semiconductor window closing the aperture, said window

transmitting radiation to be detected, said canister and window forming a hermetically sealed housing;

characterized in that:

the window has a first portion which is adapted to fit in and which is directly located in the aperture; and

the window has a second portion which is wider than the first portion, which is located outside the canister, and which forms a peripheral shoulder bearing directly against the flange.

4,803,361

PHOTOELECTRIC DEVICE WITH OPTICAL FIBER AND LASER EMITTING CHIP

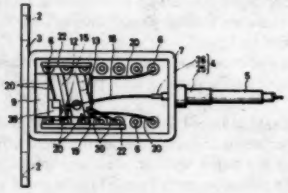
Kunio Aiki; Atsushi Sasayama; Tugio Nemoto; Makoto Haneda, all of Komoro; Satoru Ishii, Tamamura; Haruo Kugimiya, Komoro, and Tutomu Kawasaki, Tsuchiura, all of Japan, assignors to Hitachi, Ltd. and Hitachi Tobu Semiconductor, Ltd., both of Tokyo, Japan

Filed May 26, 1987, Ser. No. 54,392

Claims priority, application Japan, May 26, 1986, 61-119235; May 26, 1986, 61-119234; May 26, 1986, 61-119233; May 26, 1986, 61-119236; May 26, 1986, 61-119219

Int. Cl.[4] H01J *5/16*; G02B *6/36*

U.S. Cl. 250—227 **20 Claims**



1. A photoelectric device comprising:

a package including a wall;

a laser light emitting chip disposed within the package and capable of emitting laser light along an optical axis;

an optical fiber having a tip at one end which faces said chip, said tip being positioned to receive said laser light and spaced from said chip;

a first fixing means for securing the optical fiber to the wall of said package;

a second fixing means disposed between the optical fiber tip and the first fixing means for fixing the position of the optical fiber tip within said package; and

said first fixing means being positioned to have an offset relation from the optical axis of the light emitting chip.

4,803,362

ELECTRO-OPTICALLY ACTIVATED SWITCH WITH TACTILE FEEDBACK

Gary C. Butts, Huntington Beach, Calif., assignor to Labworks, Inc., Costa Mesa, Calif.

Filed Oct. 27, 1987, Ser. No. 113,638

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—229 **21 Claims**

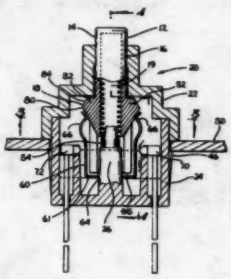
1. An optical switch comprising:

emitter means for emitting electromagnetic energy;

detector means responsive to said energy emitted by said emitter means for producing an electrical output signal in response to said energy, said emitter means and detector means disposed at respective ends of an optical path;

a resilient shutter longitudinally moveable between said emitter means and detector means for selectively interrupting said optical path, said shutter having a first substantially relaxed position and a second substantially relaxed position; and

actuator means operable by a user and having a camming surface for operative engagement with said shutter such that operation of said actuator means causes said shutter to move between said first and second substantially relaxed positions with a snap action;



whereby said user receives tactile feedback coincident with said electrical output signal when said shutter moves between said first and second substantially relaxed positions.

4,803,363

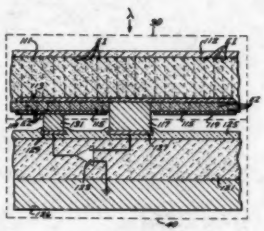
INFRARED DETECTOR WITH INTEGRAL FEEDBACK CAPACITANCE

Steve D. Gaalema, Escinitas, and Frank L. Augustine, Escondido, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 27, 1987, Ser. No. 42,757

Int. Cl.[4] G01J *5/20*; H01L *31/00, 27/14*

U.S. Cl. 250—338.4 **13 Claims**



1. An infrared detector comprising:

a photosensitive layer;

first planar contact means conductively coupled over its entire planar area to said photosensitive layer for collecting charge carriers generated by radiation incident on said photosensitive layer;

second planar contact means associated with and separated from said first planar contact means, said first and second planar contact means being substantially coextensive to substantially confine the electric contact means in the region between said first and second planar contact means; and

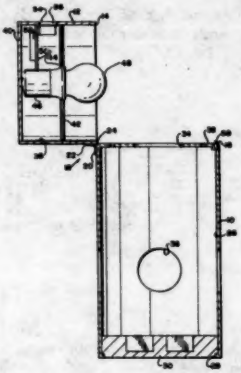
dielectric means interposed between said first and second planar contact means for dielectrically separating them, said first and second planar contact means and said dielectric means forming a feedback capacitor which provides for feedback capacitance for an externally provided amplifier associated with said detector.

4,803,364

TOOTHBRUSH CONDITIONER

Charles H. Ritter, 3219 Thomasville Rd. #17A, Tallahassee, Fla. 32312

Filed Mar. 3, 1987, Ser. No. 21,252
Int. Cl.[4] A61L 3/00
U.S. Cl. 250—455.1 18 Claims



1. A toothbrush conditioning device, comprising:
(a) a body member having an upper end;
(b) a cover member hingedly mounted to said upper end for therewith providing a conditioning chamber;
(c) means mounted to said body member for selectively positioning within said chamber a toothbrush to be conditioned;
(d) toothbrush conditioning means for sterilizing and for driving moisture away from said toothbrush carried by said cover member and movable therewith for being selectively positioned within said chamber proximate the toothbrush to be conditioned when said cover member is mounted to said upper end;
(e) a plurality of openings in said body member for venting said chamber;
(f) hinge means pivotally connecting said cover member with said body member so that said cover member may be pivoted between an open and a closed position;
(g) control means for automatically intermittently operating said conditioning means when said cover member is in said closed position; and
(h) switch means operably associated with said cover member, said body member and said control means for permitting operation of said conditioning means when said cover member is in said closed position and for preventing operation when said cover member is in said open position.

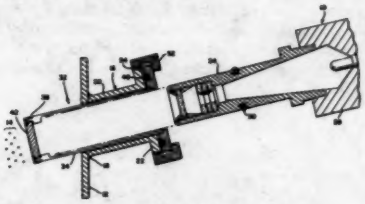
4,803,365

OPTICAL PROBE MOUNTING DEVICE

Richard J. Krause, Perkasie; Jaw F. Lee, Newtown Sq., and Craig W. Breckenridge, Allentown, all of Pa., assignors to BioChem Technology, Malvern, Pa.

Filed May 8, 1987, Ser. No. 47,850
Int. Cl.[4] G01N 21/64
U.S. Cl. 250—461.2 5 Claims

1. An optical well for receiving the insertion end of a removable fluorescence measuring optical probe facilitating mounting on a biological reactor vessel window fitting comprising:
a rigid hollow cylinder extending within said vessel and sized to closely receive said removable probe to allow said probe to closely slide within the interior of said fitting;
window means sealed to said cylinder at a location within said vessel and closing off the insertion end of said cylinder, said window means being constructed from quartz to allow passage of ultraviolet light without undue attenuation;
a flange sealingly affixed to said cyliner outside said vessel and having a sealable surface positioned to contact said fitting to permit said cylinder to extend into said vessel a predetermined distance; and



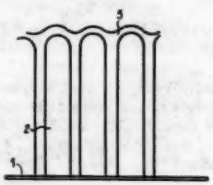
seal means extending along said sealable surface which sealingly contacts said fitting upon insertion of said well into said fitting to prevent leakage from said vessel along a path between said fitting and said well.

4,803,366

INPUT SCREEN SCINTILLATOR FOR A RADIOLOGICAL IMAGE INTENSIFIER TUBE AND A METHOD OF MANUFACTURING SUCH A SCINTILLATOR

Gérard Vieux, Pré de l'Achard 38330, St. Nazaire les Eymes, and Henri Rougeot, 5, rue Marcel Porte 38100, Grenoble, both of France

Filed Aug. 19, 1986, Ser. No. 897,938
Claims priority, application France, Aug. 23, 1985, 85 12688
Int. Cl.[4] H01J 1/62
U.S. Cl. 250—486.1 13 Claims



1. An input screen scintillator for a radiological image intensifier tube comprising a layer of juxtaposed cesium iodide needles having lateral sides extending transversally to said layer, said layer including gaps between the needles, wherein said needles are coated with a refractory material on their lateral sides within the gaps, and wherein said refractory material is transparent and has an optical refractive index approximately the same or less than that of said cesium iodide needles.

4,803,367

LIGHT BEAM SCANNING APPARATUS EMPLOYING BEAM MODULATION IN ACCORDANCE WITH THE START OF SCAN AND END OF SCAN SIGNALS

Masakazu Murase, and Hideo Ishizaka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

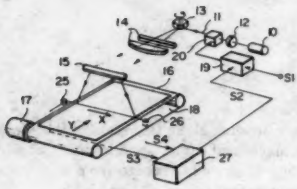
Filed Mar. 4, 1987, Ser. No. 21,879
Claims priority, application Japan, Mar. 4, 1986, 61-47093
Int. Cl.[4] G01J 5/16
U.S. Cl. 250—236 4 Claims

1. A light beam scanning apparatus wherein a light beam deflected by a rotating polygon mirror is scanned on a scan-

ning surface in a main scanning direction, the scanning surface is moved with respect to the light beam in a sub-scanning direction, and a picture element clock signal is generated, the light beam scanning apparatus comprising:

(i) photodetectors for respectively detecting passage of said light beam over a main scanning start point and passage thereof over a main scanning end point, and

(ii) a clock signal generating circuit for receiving outputs of said photodetectors, calculating the time required for the main scanning for each of mirror surfaces of said rotating polygon mirror, and changing a period of said picture



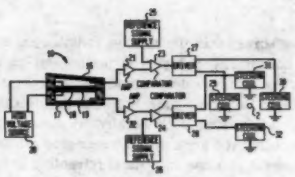
element clock signal in the course of each main scanning so that said period is proportional to said required time with respect to the mirror surface utilized for said main scanning, wherein said clock signal generating circuit comprises a memory for storing digital information on a jitter amount of said light beam for each of said mirror surfaces of said rotating polygon mirror such that a time required for the main scanning of each of the mirror surfaces is stored and is used by the apparatus for said main scanning, said picture element clock signal period being changed in accordance with said stored time for each of said mirror surfaces.

4,803,368

ASSEMBLY AND METHOD FOR MONITORING THE LATERAL POSITION OF A BEAM OF IONIZING RADIATION

Norbert Barthelmes, Walnut Creek, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Dec. 28, 1987, Ser. No. 138,759
Int. Cl.[4] G01T *1/185, 1/29*
U.S. Cl. 250—385.1 **9 Claims**



1. A transmission ion chamber assembly for detecting the lateral displacement of an incident beam of ionizing radiation, said beam being projected along a beam axis, comprising:

(a) two ion chambers located one behind the other, each chamber having two base walls and a side wall extending therebetween;

(b) a pair of electrodes disposed in each chamber, each of said electrode pairs including a collecting electrode and a high voltage electrode, the electrodes of each pair being larger than the cross-section of the incident beam and being separated by a distance which varies gradually along a specific measuring axis, the measuring axes of both chambers being inclined with respect to each other; and

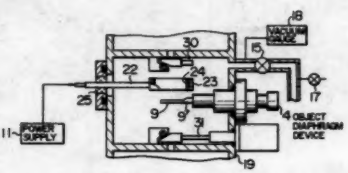
(c) means for deriving from each collecting electrode a current signal as a function of the position of said beam along the associated measuring axis.

4,803,369

PURIFICATION DEVICE FOR CHARGED PARTICLE BEAM DIAPHRAGM

Tadashi Otaka, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1987, Ser. No. 771
Claims priority, application Japan, Jan. 10, 1986, 61-2182
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—310 **11 Claims**



1. An electron beam apparatus comprising:

an evacuated envelope;

means for generating an electron beam in said envelope;

means for converging the electron beam on a sample;

a diaphragm plate positioned between the beam generating means and said sample, said plate having an aperture for defining an angular aperture of the electron beam;

means for holding the diaphragm plate in such a location as to become contaminated by reason of an association with the electron beam;

means for generating electrically conductive particles at a position adjacent the beam diaphragm while the beam diaphragm remains in the envelope; and

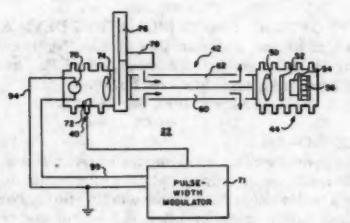
means for keeping the beam diaphragm at a degree of vacuum different from the degree of vacuum at the electron beam generating means under conditions so that said particles attach to the surfaces of the diaphragm plate and the diaphragm plate holding means while said diaphragm plate and diaphragm plate holding means remain in said envelope.

4,803,370

INFRARED LIGHT GENERATION

Robert D. Eckles, Malcolm, Nebr., assignor to Li-Cor, Inc., Lincoln, Nebr.

Filed May 18, 1987, Ser. No. 50,878
Int. Cl.[4] G01N *21/35*
U.S. Cl. 250—504 R **72 Claims**



1. A carbon dioxide analyzer comprising:

a source of infrared light;

a flow cell adapted to contain a gas;

a detector for converting infrared radiation to electrical signals; and

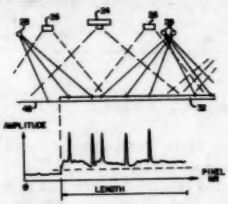
said source of infrared light including combined means energized from a single source for serving as a getter and an emitter of infrared light.

4,803,371

OPTICAL SCANNING METHOD AND APPARATUS USEFUL FOR DETERMINING THE CONFIGURATION OF AN OBJECT

Sven O. Durland, Lake Oswego, Oreg., assignor to The Coe Manufacturing Company, Painesville, Ohio

Filed Sep. 30, 1987, Ser. No. 103,029
Int. Cl.[4] G01B 11/02, 11/04
U.S. Cl. 250—560 **25 Claims**



14. An apparatus useful for characterizing the configuration of a three-dimensional object comprising:

support means for supporting the object;

first light means for illuminating a plurality of positions on a surface of the object with light of a first intensity;

second light means for illuminating at least one region on a surface of the object with light of a second, different intensity while said object is also being illuminated by the first light means; and

photodetector means, positioned to view at least portions of the surfaces illuminated by the first and second light means, for producing a single output signal having a plurality of values corresponding to the intensity of light reflected by the object from both the first and second light means at a plurality of positions within the field of view of the photodetector means.

4,803,372

LINE POSITION DETECTING APPARATUS FOR DETECTING A V-SHAPED INDENT

Tadashi Hirata, Yamato; Katsumi Koyama, Hiratsuka; Hideaki Takahashi, Atsugi; Yasuhiro Harashima, Atsugi; Michio Kitahara, Atsugi; Katsuyuki Igarashi, Itabashi; Jun Kitamura, Yokohama; Hiroshi Kikuchi, and Kimiyuki Narisada, both of Tokyo, all of Japan, assignors to Amada Company, Limited, Japan

Filed Apr. 10, 1987, Ser. No. 37,144
Claims priority, application Japan, Apr. 11, 1986, 61-082369
Int. Cl.[4] G01B 11/00
U.S. Cl. 250—561 **10 Claims**

1. A line position detecting apparatus for detecting a V-shaped indent described on a surface, which comprises:

(a) means for irradiating the surface to be measured with a light beam;

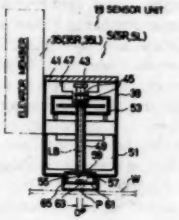
(b) means for rotating the light beam emitted from said measured surface irradiating means so as to describe a circular locus on the surface with a coordinates origin as its center;

(c) means for detecting an angular position of the light beam rotating means from a coordinates axis;

(d) means for detecting an intensity of light beam reflected from the V-shaped indent in the form of voltage; and

(e) means for detecting an angular position of at least one point of intersection between the V-shaped indent and the circular locus on the basis of change in voltage level of the detected signal indicative of the intensity of the reflected light beam and calculating the intersection point indicated by x-y coordinates on the basis of a diameter of the irradiated circular locus and the detected angular position;

wherein said angular position detecting means compares the detected voltage level indicative of the reflected light beam intensity with a reference voltage level Vc to obtain



four intersections θ_3, θ_4, θ_6 and θ_7; and said intersection point calculating means calculates two intermediate angular positions $\theta_5=(\theta_3+\theta_4)/2$ and $\theta_8=(\theta_6+\theta_7)/2$, a V-shaped angular position $\theta_9=(\theta_5+\theta_8)/2$, a V-shaped indent position as

$$-x=(D/2)\cos\theta_9$$
$$y=(D/2)\sin\theta_9$$

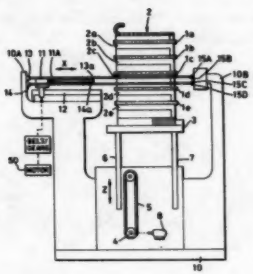
where D denotes a diameter of the irradiated circular locus.

4,803,373

CONVEYOR ARM APPARATUS WITH GAP DETECTION

Kazunori Imamura, Tokyo; Fuminori Hayano, Fujisawa; Yukio Kakizaki, Yokohama, and Jiro Kobayashi, Yamato, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jan. 27, 1987, Ser. No. 7,190
Claims priority, application Japan, Jan. 29, 1986, 61-17250
Int. Cl.[4] G01N 21/86; G01V 9/04
U.S. Cl. 250—561 **32 Claims**



1. An apparatus for unloading a carrier means in which a plurality of substrates are stored substantially parallel to each other in locations spaced by a predetermined distance, comprising:

(a) stage means on which said carrier means is disposed;

(b) an arm member provided with a mounting surface for receiving each of said plurality of substrates, said arm member being formed such that said mounting surface is substantially parallel to each of said plurality of substrates stored in said carrier means;

(c) moving means for moving said arm member in a predetermined direction to insert a part of said arm member into

a gap between adjacent ones of said plurality of substrates in said carrier means, said part of said arm member having said mounting surface, said predetermined direction being substantially parallel to said mounting surface;

(d) light detecting means;

(e) projecting means for projecting a pair of light beams to said light detecting means such that the light paths of said light beams are substantially parallel to said mounting surface with one of said light beams being disposed opposite to the other of said light beams with respect to said part of said arm member in a direction transverse to said mounting surface, said light detecting means being disposed at an opposite side of said stage means in said predetermined direction with respect to said projecting means, said light detecting means detecting intensity of each of said light beams and outputting light detecting signals corresponding to the detected intensities;

(f) substrate detecting means responsive to said light detecting signals for detecting that at least one of said plurality of substrates stored in said carrier means is in at least one of said light paths, and for outputting a substrate detecting signal; and

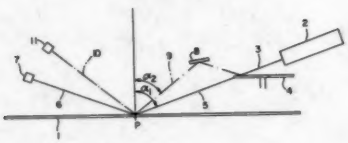
(g) control means responsive to said substrate detecting signal for causing relative displacement between said arm member and said stage means along a direction which is substantially perpendicular to said predetermined direction.

4,803,374

CONTINUOUS MEASUREMENT OF THE SURFACE ROUGHNESS OF A COLD-ROLLED PRODUCT

Guy A. Monfort, Montegnee, and Adolphe A. Bragard, Esneux, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum Voor Research in De Metallurgie, Brussels, Belgium

Filed Dec. 5, 1986, Ser. No. 938,239
Claims priority, application Luxembourg, Dec. 5, 1985, 86194
Int. Cl.[4] G01H *21/86*
U.S. Cl. 250—571 12 Claims



1. A method for continuously optically measuring the surface roughness of a cold-rolled product, comprising:

determining permitted surface roughness values for said product;

transmitting an incident light beam having a wavelength at least equal to a maximum value of said permitted surface roughness values onto said product surface;

receiving a light beam reflected from said product surface;

measuring the light intensity of said received reflected light beam;

determining from said measured light intensity a measured value of surface roughness of the product; and

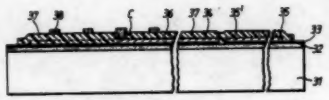
comparing said measured value of surface roughness with said permitted surface roughness values.

4,803,375

IMAGE SENSORS AND METHODS OF MANUFACTURING SAME INCLUDING SEMICONDUCTOR LAYER OVER ENTIRE SUBSTRATE SURFACE

Tamio Saito, Tokyo; Satoshi Takayama, Kawasaki; Yoshiyuki Suda; Osamu Shimada, both of Yokohama, and Ken-ichi Mori, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 12, 1986, Ser. No. 941,192
Claims priority, application Japan, Dec. 27, 1985, 60-294054; Mar. 28, 1986, 61-68665
Int. Cl.[4] H01J *40/14*; H01L *27/14*
U.S. Cl. 250—578 27 Claims



1. An image sensor, comprising:

a substrate;

a semiconductor layer continuously formed over the entire surface of said substrate;

a plurality of first electrode formed on said semiconductor layer, said plurality of first electrodes arranged in a predetermined arrangement and electrically connected to said semiconductor layer on a first region of said substrate;

a plurality of electrode portions formed on said semiconductor layer on said first region of said substrate and arranged in said predetermined arrangement, being electrically connected to said semiconductor layer on said first region, groups of said electrode portions each having a common second electrode formed on said semiconductor layer, said plurality of electrode portions having a predetermined arrangement and positioned adjacent said first plurality of electrodes wherein said electrode portions, said first electrodes and said semiconductor layer positioned therebetween comprise photo-sensing elements;

first wires formed on said semiconductor layer and respectively extended from said first electrodes to said semiconductor layer on a second region of said substrate;

an insulating layer formed on said first and second region, covering said photo-sensing elements and said first wires; and

second wires formed in parallel on said insulating layer of said second region, said second wires electronically connected to said first wires at through holes formed in said insulating layer.

4,803,376

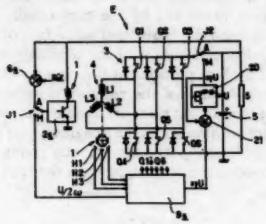
CONTROL METHOD FOR A REVERSIBLE MOTOR - GENERATOR ELECTRICAL MACHINE FOR A MOTOR VEHICLE AND CONTROL INSTALLATION FOR THE IMPLEMENTATION OF SUCH METHOD

Huu Can N'Guyen, Rueil Malmaison, France, assignor to Valeo, Paris, France

Filed Aug. 26, 1987, Ser. No. 89,393
Claims priority, application France, Sep. 11, 1986, 86 12697
Int. Cl.[4] H02K *17/12, 17/42*
U.S. Cl. 290—22 10 Claims

1. A method of controlling a reversible electrical machine, which is capable of operating either as a generator (alternator) or as a motor, intended for a motor vehicle, said method comprising providing a machine comprising an armature winding, a regulator capable of regulating the voltage delivered by the armature to the electrical system of the vehicle and an inductor winding, the inductor winding being controlled during operation as an alternator by said regulator and operating said machine as a motor by controlling at least one of the supply

voltage for the armature and the excitation in order to obtain the desired torque-speed characteristics, wherein the machine is controlled to operate as a starter motor, the method including establishing a regulated voltage from the battery voltage which is higher than said battery voltage, and using this regulated voltage at least for supplying the armature with power.



4,803,377

STARTER MOTOR CONTROL DEVICE FOR ENGINES

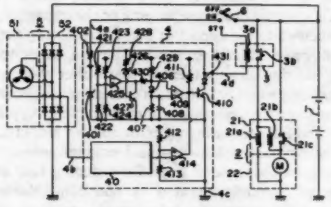
Shiro Iwatani, and Kazuya Tokugawa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,274

Claims priority, application Japan, Mar. 18, 1987, 62-40554[U]

Int. Cl.[4] F02N *11/08*

U.S. Cl. 290—38 R **1 Claim**



1. A starter motor control device comprising:

a starter motor for starting an engine,

an auxiliary switch which can interrupt the energization to the starter motor,

a circuit for detecting the rotation speed of the engine or other mechanism related to the rotation speed of the engine to output a signal for preventing the starter motor from being conversely driven by the started engine,

a circuit for restraining the starter motor from being energized again for a predetermined time just after the energization to the starter motor is cut off,

a first detecting means having a first set value for judging the voltage at an auxiliary switch driving terminal for a switching element for driving the auxiliary switch,

a second detecting means having a second set value for judging the voltage of the auxiliary switch driving terminal, and

a circuit for determining the operation of the switching element based on the judgements given by the first and the second detection means.

4,803,378

PULSE GENERATOR

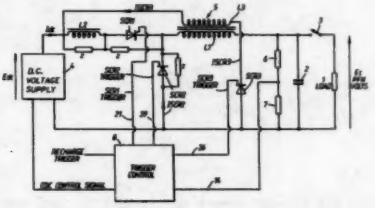
Robert Richardson, Essex, England, assignor to The Marconi Company Limited, Stanmore, England

Filed Jan. 28, 1986, Ser. No. 823,451

Claims priority, application United Kingdom, Jan. 31, 1985, 8502480

Int. Cl.[4] B23P *1/02*

U.S. Cl. 307—108 **4 Claims**



1. A pulse generator, comprising:

a capacitor:

means for periodically discharging the capacitor to generate pulses of electricity;

means for recharging the capacitor between pulses;

sensing means for sensing a residual reverse polarity charge on the capacitor after generation of a pulse; and

residual charge utilization means controlled by the sensing means so that in response to the sensing of a reverse polarity charge the residual charge utilization means uses energy stored in the capacitor by virtue of the reverse charge to assist in recharging the capacitor for the next pulse,

wherein the means for recharging comprises an inductor, wherein the residual charge utilization means comprises a first switch for connecting the inductor across the capacitor, and wherein the sensing means comprises means for closing the first switch in response to detection of the reverse polarity charge and for opening the first switch when the energy giving the capacitor the reverse polarity charge has discharged through the inductor and recharged the capacitor with a forward charge.

4,803,379

CIRCUIT ARRANGEMENT FOR POWER SUPPLY FOR ELECTRICAL AND ELECTRONIC CONTROL OR REGULATING DEVICES

Ros Remigio, St. Georgen, and Storz Achim, Triberg, both of Fed. Rep. of Germany, assignors to Dieter Grässlin Feinwerktechnik, Fed. Rep. of Germany

PCT No. PCT/DE86/00343, § 371 Date May 6, 1987, § 102(e) Date May 6, 1987, PCT Pub. No. WO87/01880, PCT Pub. Date Mar. 26, 1987

PCT Filed Aug. 28, 1986, Ser. No. 45,849

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532758

Int. Cl.[4] H03K *3/00*; H01L *9/12*

U.S. Cl. 307—112 **1 Claim**

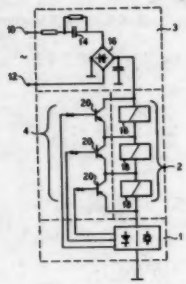
1. A circuit arrangement comprising: a purely capacitive power supply having a series capacitor for providing current flow;

a plurality of power consumers connected in series with said power supply;

a plurality of semiconductor switches, each of said power consumers of said plurality of power consumers having one of said semiconductor switches of said plurality of semiconductor switches connected in parallel therewith;

a control element for causing power to be selectively supplied via a respective semiconductor switch to at least one of said plurality of power consumers and connected in

series with said plurality of power consumers and said power supply, said current flow determined by said series



capacitive in said power supply and by said selected power consumers.

4,803,380

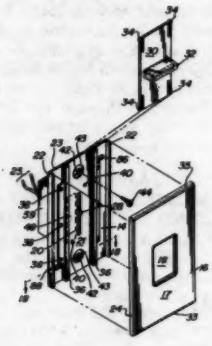
COVER AND SUPPORT PLATE ARRANGEMENT FOR WALL MOUNTED DEVICES

Elliot G. Jacoby, Jr., Glenside; Michael J. D'Aleo, Ottsville; David G. Lachaco, Macungie; Joel S. Spira, Coopersburg; Richard A. Wagner, Allentown; Stephen J. Yuhasz, Zionsville, all of Pa., and David H. Dowler, Raymond, Me., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Continuation-in-part of Ser. No. 839,296, Mar. 13, 1986, abandoned. This application Jun. 20, 1986, Ser. No. 877,229

Int. Cl.[4] H01H *47/00*; H01C *10/00*

U.S. Cl. 307—157 **218 Claims**



1. An apparatus comprising: a. a support plate adapted for mounting to a wall box embedded in a wall, the support plate having overall surface dimensions greater than the corresponding dimensions of the wall box and including a generally flat front and rear surface, the front surface having a pair of spaced upstanding portions disposed adjacent opposing vertical side edges thereof; b. a cover plate juxtaposed over the front surface of the support plate, spaced therefrom so as to provide an air gap between the rear surface of the cover plate and the front surface of the support plate and to provide a low profile with respect to the wall surface on which the support plate is to be mounted, the overall surface dimensions of the cover plate being greater the the corresponding dimensions of the support plate including first portions laterally extending beyond the vertical side edges of the support plate; c. an electric circuit having a heat generating controllably conductive device therein, the heat generating device thermally connected to the support plate and adapted to be connected in series with a controlled load and to be electrically coupled to field wiring from a power source provided to the wall box; and d. the front surface of the support plate, the rear surface of the cover plate and the pair of upstanding portions defining a chimney for the dissipation of heat generated by the controllably conductive device, the open opposing horizontal side edges of the support plate defining inlets and outlets of the chimney; whereby the laterally extending first portions of the cover plate cast shadows along vertical sides of the support plate such that the vertical sides of the support plate are visible only when viewed at extreme angles with respect to an imaginary line perpendicular to the plane of the support plate, thereby giving the appearance that the cover plate is floating from the wall.

4,803,381

BIAS CURRENT COMPENSATING CIRCUIT, PARTICULARLY FOR SAW-TOOTH WAVE GENERATORS

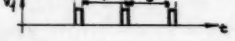
Silvano Gornati, Casorezzo; Roberto Viscardi, Lissone, and Silvano Coccetti, Vittuone, all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Jun. 1, 1987, Ser. No. 55,952

Claims priority, application Italy, Jun. 18, 1986, 20836 A/86

Int. Cl.[4] H03K *4/08*, *17/56*, *4/10*; G05F *3/16*

U.S. Cl. 307—228 **5 Claims**



1. Bias current compensating circuit, in particular for saw-tooth wave generators, comprising a controllable current source stage, for feeding an adjustable value charge current to an external element, in particular a capacitor, a control element connected to the capacitor for alternately and periodically controlling charging and discharging of the capacitor, a buffer stage connected to the capacitor and for receiving therefrom a saw-tooth wave voltage generated by the capacitor during charging and discharging thereof, said buffer stage supplying to the capacitor an error current, a current sensor connected to said buffer stage for detecting said error current supplied to the capacitor and for generating an error current amplitude signal, and means connected between said current sensor and said controllable current source stage for reducing said adjustable value charge current generated by said controllable current source stage by an amount substantially equal to said error current amplitude signal.

4,803,382

VOLTAGE COMPARATOR CIRCUIT

Hiroshi Tanimoto, Kawasaki, and Mikio Hayashibara, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1987, Ser. No. 136,974

Claims priority, application Japan, Dec. 25, 1986, 61-307957

Int. Cl.[4] H03K *5/08*, *5/24*

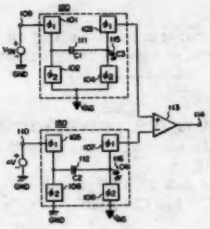
U.S. Cl. 307—362 **8 Claims**

1. A voltage comparator circuit comprising:

a first switched capacitor circuit for receiving a first signal voltage to be compared, said first switched capacitor circuit having a first switching element connected between an input terminal of said first signal voltage and one terminal of a first capacitor, a second switching element connected between said one terminal of said first capacitor and a first fixed potential point, a third switching element connected between an output terminal of said first switched capacitor circuit and the other terminal of said

first capacitor, and a fourth switching element connected between the other terminal of said first capacitor and said first fixed potential point;

a second switched capacitor circuit for receiving a second signal voltage to be compared, said second switched capacitor circuit having a fifth switching element connected between an input terminal of said second signal voltage and one terminal of a second capacitor, a sixth switching element connected between said one terminal of said second capacitor and a second fixed potential point, a



seventh switching element connected between an output terminal of said second switched capacitor circuit and the other terminal of said second capacitor, and an eighth switching element connected between the other terminal of said second capacitor and said first potential point, said second switched capacitor circuit matching with said first switched capacitor circuit; and

a differential voltage comparator having first and second input terminals for receiving outputs from said first and second switched capacitor circuits, respectively.

4,803,383

TRANSISTOR-TRANSISTOR LOGIC CIRCUIT

Katsuji Hirochi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 2, 1987, Ser. No. 115,870

Claims priority, application Japan, Oct. 31, 1986, 61-260942

Int. Cl.[4] H03K *19/003, 19/088, 17/60, 17/28*

U.S. Cl. 307—456 **18 Claims**

1. A transistor-transistor logic circuit, comprising:

first and second power supply lines;

at least one input terminal operatively connectable to receive an input signal;

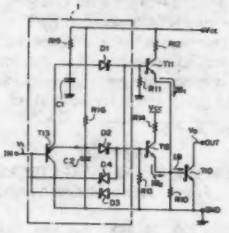
an output terminal;

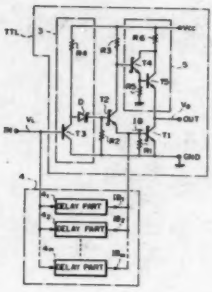
an output transistor having a base, an emitter operatively connected to said second power supply line and a collector operatively connected to said output terminal;

resistors;

a plurality of phase-splitting transistors, each having a base, an emitter operatively connected to the base of said output transistor and a collector operatively connected through one of said resistors to said first power supply line; and

a delay circuit operatively connected between said input terminal and each base of said plurality of phase-splitting transistors, transmitting a change of the input signal applied to said input terminal to each base of said plurality of





phase-splitting transistors separately and at different propagation delay times.

4,803,384

PULSE AMPLIFIER SUITABLE FOR USE IN THE SEMICONDUCTOR LASER DRIVING DEVICE

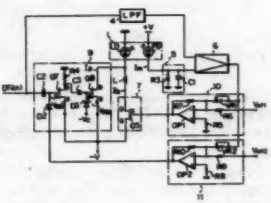
Kazuo Yamane; Masakazu Mori, both of Kawasaki; Takashi Tsuda, Tokyo; Yoshinori Ohkuma, and Kazuhiro Suzuki, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 21, 1986, Ser. No. 921,110

Claims priority, application Japan, Oct. 22, 1985, 60-234634; Mar. 19, 1986, 60-059464

Int. Cl.[4] G06G *7/12;* **H03L** *5/00;* **H01S** *3/00*

U.S. Cl. 307—490 **8 Claims**



1. A pulse amplifier for varying a pulse amplitude of an input pulse in response to a control signal, comprising:

first and second FETs connected in cascade and having pinch-off voltages determined by gate-source voltages under which currents flowing at their drains become zero;

said first FET formed having a gate electrode connected to receive an input pulse and a gate-source voltage variable

in response to a control signal and having a drain, said first FET biased such that, at the output of the drain, a first pulse is cut off at an upper portion and a lower portion of the inpout pulse at a pinch-off voltage thereof; and

said second FET having a gate connected to receive the input pulse output from said first FET, having a drain and having a gate-source voltage biased such that the drain outputs a second pulse cut-off at the side portions of the first pulse corresponding to the upper and lower portions of the input pulse which are not cut off.

4,803,385

PHASE DETECTING CIRCUIT

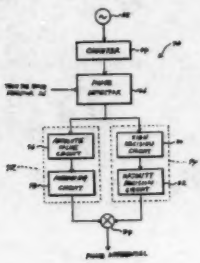
Hisaru Nawata, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 24, 1987, Ser. No. 17,625

Claims priority, application Japan, Feb. 25, 1986, 61-39416

Int. Cl.[4] H03B *3/64;* **G01R** *25/00;* **H03K** *5/26*

U.S. Cl. 307—516 **5 Claims**



1. A phase detecting circuit for detecting a phase differential between a bit timing and a reference clock, comprising:

a phase detector for producing a phase differential between said reference clock and an input signal including bit timing which has a same frequency as said reference clock;

an absolute value averaging circuit for averaging absolute values of a plurality of consecutive outputs of said phase detector;

a sign majority decision circuit for producing one of positive and negative signs of said consecutive outputs of said phase detector which is decided by majority; and

a multiplier for multiplying an output of said absolute value averaging circuit and an output of said majority decision circuit, the resulting product being delivered as a phase differential.

4,803,386

DIGITAL AMPLIFIER CONFIGURATION IN INTEGRATED CIRCUITS

Rainer Kraus, München; Oskar Kowarik, Grafing, and Manfred Paul, Unterföhring, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and München, Fed. Rep. of Germany

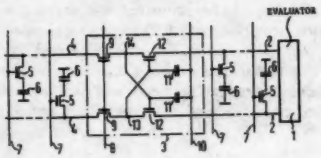
Filed Nov. 17, 1987, Ser. No. 121,521

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1987, 3639347

Int. Cl.[4] G01R *19/00;* **H03K** *3/26;* **G11C** *7/00*

U.S. Cl. 307—530 **3 Claims**

1. Digital amplifier arrangement in an integrated circuit for amplification of a voltage difference, comprising a pair of bit lines having a pair of respective extension lines connected thereto via respective isolation transistors; a clock line controlling the isolation transistors; a digital amplifier containing the isolation transistors, said digital amplifier having a pair of cross-connected transistors for amplifying a voltage difference between said extension lines; and an evaluator connected to



said cross-connected transistors via said bit lines for reading said voltage difference between the extension lines.

4,803,387

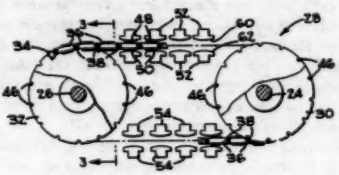
ELECTRIC DRIVE MOTOR

Gene J. Selder, Bloomington, Minn., assignor to FMC Corporation, Chicago, Ill.

Filed Jun. 29, 1987, Ser. No. 67,746

Int. Cl.[4] H02K *41/06*

U.S. Cl. 310—12 **13 Claims**



1. A linear belt motor comprising:

a pair of aligned and rotatable sprockets:

a plurality of non-magnetic rigid links connected to form a belt;

said belt trained over said sprockets;

a pair of permanent magnets affixed to each of said links with opposite magnetic poles thereof adjacent the associated link;

a plurality of u-shaped stator poles positioned between said sprockets and straddling said belt;

each of said stator poles having a pair of pole faces of a large radius and a length substantially twice the width of said magnets;

a coil wound on each stator pole;

position sensing means to determine the position of said magnets relative to said stator poles; and

control circuit means responsive to said position sensing means to sequentially energize each of said coils in order to attract and repel the permanent magnets adjacent each of said stator poles.

4,803,388

LINEAR MOTOR

Hideo Nikura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 918,151

Claims priority, application Japan, Oct. 28, 1985, 60-241144

Int. Cl.[4] H02K *41/00*

U.S. Cl. 310—12 **2 Claims**

1. A linear motor, comprising:

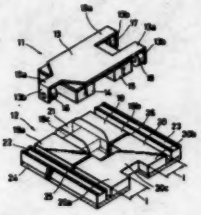
a first yoke;

a second yoke spaced apart with width of a first gap from said first yoke;

a member of nonmagnetic material connecting said first yoke to said second yoke to form a flat surface;

a magnet spaced apart the width of a second gap from and

arranged in opposed relation to said first yoke and said second yoke;
plural coils spaced apart the width of said second gap from and arranged in opposed relation to said first yoke and said second yoke;
a third yoke forming a magnetic circuit with one of said first



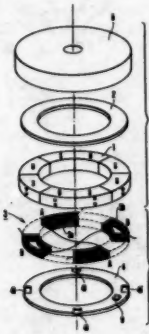
yokes and said second yoke and with said magnet and at least one of said coils, said third yoke being arranged parallel and opposed to said first yoke and said second yoke;
said plural coils being wound cores provided at end portions of said third yoke; and
said magnet being fixed to said third yoke.

4,803,389

STEPPING MOTOR, METHOD OF DRIVING THE SAME AND DRIVE CIRCUIT THEREFOR

Shigeki Ogawa, Tokyo, and Eiichi Tsukada, Tokorozawa, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jul. 17, 1987, Ser. No. 74,823
Claims priority, application Japan, Jul. 22, 1986, 61-170814
Int. Cl.[4] H02K 37/08
U.S. Cl. 310—49 R **6 Claims**



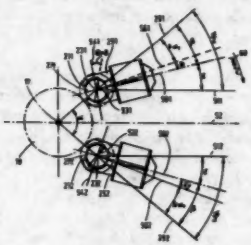
1. A stepping motor comprising:
a first element including at least two permanent magnets each having a pair of N and S poles;
a second element including a yoke separated from said first element by a predetermined interval;
said first and second elements being relatively movable;
said second element including a two-phase coil arranged on said yoke at spaced locations corresponding to the relative spacing between said at least two permanent magnets, and means for generatin a static detent torque between said first and second elements at predetermined locations along the direction of movement diffusion from the locations of the detent torque due to the interaction between the magnetic field generated by the permanent magnets and the magnetic field generated by the coil when energized so that said first and second elements achieve a stable static detent position at one of said predetermined locations when the coil is de-energized;
means for supplying a drive current to one of the coils of said two-phase coil; and
means for supplying said drive current to the other coil of said two-phase coil after said two-phase coil is energized.

4,803,390

DUAL MOTOR DRIVE ARRANGEMENT FOR A SMALL DOMESTIC APPLIANCE

Leo Bertram, Stolberg, Fed. Rep. of Germany; Hugo Schemmann, Schaesberg, Netherlands, and Romuald L. Bukoschek, Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1987, Ser. No. 122,982
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, 3640397
Int. Cl.[4] H02K 7/14, 51/00
U.S. Cl. 310—50 **11 Claims**



1. A drive arrangement for a small electrically driven appliance comprising
a common drive gear wheel which is connected to a load, said drive gear wheel being characterized by a pitch angle $\alpha_2 = \pi m/r_2$, where r_2 is the radius of the drive gear wheel and m is its module,
a pair of two-pole single phase synchronous drive motors each having a stator with a stator field and a permanent megnet rotor mounted on a rotor shaft and having a direction of polarization, each motor having a gear wheel mounted on its rotor shaft and meshing with said common drive gear wheel, the angle θ between the main direction of the stator field and the rotor field being the same for all rotors for a positive stator current, whereby when the stator coils are not energized the rest position $\theta = \theta_0$ established by the magnetic detent torque is maintained and all the motors experience a torque in the same direction when voltage is applied,
the lines connecting the rotor gear wheel axes to the common drive gear wheel axis enclosing an angle α which is a multiple n' of the pitch angle α_2, the value of n' being derived from the relationship

$$\frac{\pi}{90} \arcsin \frac{mz_1/2 + K}{m(z_1 + z_2)/2} < n'\alpha_2 < 2\pi \frac{\pi}{90} \arcsin \frac{mz_1/2 + K}{m(z_1 + z_2)/2}$$

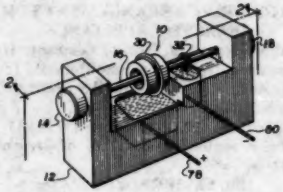
where
z_1 = the number of teeth of a rotor gear wheel,
z_2 = the number of teeth of the common drive gear wheel,
K = the whole depth of the teeth, and n' need not be an integer, all the length dimensions being expressed in mm.

4,803,391

UNIPOLAR MOTOR AND MECHANICAL CONVERSION SYSTEM AND METHOD

Sidney Abrahams, Miami, Fla., assignor to Genedyne Corp., Miami, Fla.

Filed Apr. 17, 1987, Ser. No. 39,382
Int. Cl.[4] H02K *31/04, 13/00*
U.S. Cl. 310—178 12 Claims



1. An electro-mechanical converter for generating mechanical power from a D.C. power source comprising:

a rotatable rotor made of conductive but low permeable material;

at least one disk having a center and a periphery integral with and made of similar material as said rotor;

means for establishing a unidirectional and uniform magnetic field through a circumferential zone of said one disk between the center and said periphery over a substantially radial mid-section thereof;

means for introducing current from said D.C. power source at a fixed location relative to said rotatable rotor and at the periphery of said one disk;

circuit completing means connecting the center of the disk and the periphery of the disk in series and exteriorly of the disk, for current flow through the converter; and

said means for establishing said field comprising magnet means on one side of said disk.

4,803,392

PIEZOELECTRIC TRANSDUCER

Keiko Kushida, Kunitachi; Hiroshi Takeuchi, Matsudo; Toshio Kobayashi, Tokyo; Kazumasa Takagi, Tokyo, and Kenzo Susa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

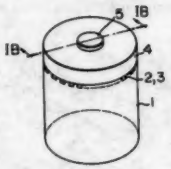
Filed Aug. 18, 1987, Ser. No. 86,488
Claims priority, application Japan, Sep. 26, 1986, 61-225935
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—311 18 Claims

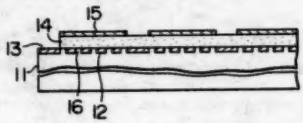
1. A piezoelectric transducer comprising:

a substrate of a single crystal having a lattice constant substantially equal to that of a perovskite-type piezoelectric crystal, said substrate having a number of grooves formed on a main surface of

said substrate at intervals;

a first electrode comprising metal formed within said grooves of substrate;





a piezoelectric thin film of said perovskite-type piezoelectric crystal so formed as to cover said main surface of said substrate and said first electrode within said grooves; and

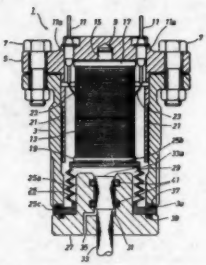
a second electrode formed on said piezoelectric thin film.

4,803,393

PIEZOELECTRIC ACTUATOR

Takeshi Takahashi, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 14, 1987, Ser. No. 73,155
Claims priority, application Japan, Jul. 31, 1986, 61-180349; Aug. 19, 1986, 61-126359[U]; Apr. 24, 1987, 62-102444
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 15 Claims



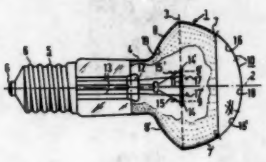
1. A piezoelectric actuator for moving an object member by utilizing a dimensional change of a piezoelectric element, comprising an envelope between the piezoelectric element and the object member, said envelope comprising a cylinder having a bellows in a side wall of the cylinder, one end of the cylinder being abutted on the piezoelectric element and the other end of the cylinder being closed by a cap member having a hole, said object member being slidably disposed in said hole, and said envelope hermetically containing a fluid, wherein said cylinder is contracted or expanded responsive to a dimensional increase or decrease in the piezoelectric element.

4,803,394

LAMP VESSEL FOR MULTIPLE LAMP TYPES

Petrus A. J. Holten, Weert, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 5, 1987, Ser. No. 22,160
Claims priority, application Netherlands, Feb. 25, 1987, 8700464
Int. Cl.[4] H01K 1/28, 1/32
U.S. Cl. 313—113 9 Claims



1. A symmetrical lamp envelope having an axis of symmetry, comprising:

(a) a neck shaped first portion:

(b) an internally concave second portion extending outwardly from said necked shaped portion and terminating at the largest diameter of said lamp envelope, said second portion extending more in a direction transverse to said axes of symmetry than along said axis, said second portion being a body of revolution of a parabola branch about said lamp envelope axis of symmetry, the axis of symmetry being between said parabola branch and the focus of said second branch, said parabolic portion having a locus of foci in a plane transverse to said axis of symmetry;

(c) an internally concave third portion smoothly merging with said second portion at said largest diameter and extending away from said largest diameter more along the axis of symmetry than transverse to said axis of symmetry, said third portion being a body of revolution of a circular arc about said axis of symmetry, the axis of symmetry lying between the center of curvature of said circular arc and said circular arc, said center of curvature lying in a region which extends from said locus of foci towards said neck portion; and

(d) an internally concave fourth wall portion opposite said first and second portions smoothly joining said third portion.

4,803,395

PROCESS FOR THE MANUFACTURE OF A PLATINUM-TIPPED BIMETALLIC CENTRAL ELECTRODE FOR AN IGNITION PLUG AND THE ELECTRODE PRODUCED ACCORDING TO THIS PROCESS

Michel Matesco, Moingt Montbrison, France, assignor to Eyquem, Nanterre, France

Filed Sep. 4, 1987, Ser. No. 93,003
Claims priority, application France, Sep. 8, 1986, 86 12558
Int. Cl.[4] H01T 21/02
U.S. Cl. 313—141 7 Claims

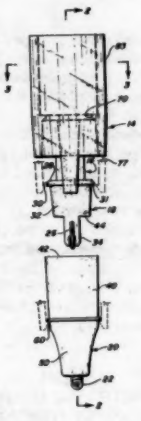
1. Process for the manufacture of a platinum-tipped bimetallic central electrode for an ignition plug, consisting in introducing a copper slug (5) into a nickel cup (1), in extruding the cup-and-slug assembly and in shaping it to produce a bimetallic electrode, characterized in that, before the introduction of the said copper slug into the cup, a platinum tip (2) is positioned on the nickel cup (1) by electrical welding in order to ensure its being maintained in place and it is then permanently fastened by a brazing operation under vacuum.

4,803,396

LIGHTBULB ASSEMBLY HAVING LATCHING RETAINING MEANS

Gerald Kelner, 4101 N.W. 132 St., Miami, Fla. 33054

Continuation-in-part of Ser. No. 922,313, Oct. 23, 1986, abandoned. This application Sep. 14, 1987, Ser. No. 96,289
Int. Cl.[4] H01R 13/20
U.S. Cl. 313—318 11 Claims



1. In combination:

an electrically wired socket including electrical connection means in the socket,

a lightbulb with an associated filament, a base, and electrical leads coupled to said filament and extending out of said base, said base being sized and configured for snug receipt in said socket with said electrical leads in electrical engagement with said electrical connection means, said base having an axial face adjacent said bulb of a greater diameter than said bulb,

keeper means having a hollow cylindrical form including a lateral portion with an opening through which the bulb extends, said lateral portion having an inner annulus, said inner annulus bearing axially against said axial face of said base outboard of said bulb and, latch means having first and second interengaging portions respectively integrally fixed on said socket and said cylindrical form for normal hooked-up engagement with one another to releasably maintain said lightbulb in said socket at all times in normal use.

4,803,397

INDIRECTLY HEATED DISPENSER METAL CAPILLARY CATHODE FOR ELECTRICAL DISCHARGE DEVICES

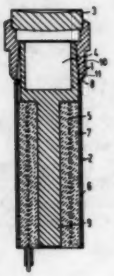
Hinrich Heynisch, Graefelfing; Josef Hauser, Bad Wiessee, both of Fed. Rep. of Germany, and Erwin Hübner, deceased, late of Grafing, Fed. Rep. of Germany (by Rosa Maria Hübner, legal representative), assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 10, 1987, Ser. No. 83,146

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1986, 3627384

Int. Cl.[4] H01J *1/28, 19/22*

U.S. Cl. 313—337 **3 Claims**



1. An indirectly heated metal capillary dispenser cathode for electrical discharge vessels, comprising, a hollow-cylindrical head portion to which a porous emission wafer of refractory metal such as, for example, porous sintered tungsten vapor-deposited with osmium is attached at its outer end face, a cathode cartridge attached to said head portion and containing an active material supply such as, for example, barium oxide, and includes a helical heater formed therein and which is surrounded by a sleeve of, for example, molybdenum, wherein said hollow-cylindrical head portion (1) has a conically-shaped opening facing said cathod cartridge (2); and said cathode cartridge (2) is conically tapered and mates with said conical opening of said hollow-cylindrical head portion (1); and said hollow-cylindrical head portion (1) and said cathode cartridge (2) are connected together by a weld (8) formed in the edge region of said metal sleeve (6).

4,803,398

ELECTRON GUN WITH ONE DIRECTLY HEATABLE AND ONE INDIRECTLY HEATABLE CATHODE

Reinhardt Kraft, Altenstadt, and Horst Ranke, Alzenau, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,709

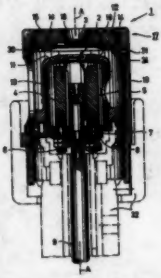
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534792

Int. Cl.[4] H01J *1/20*

U.S. Cl. 313—337 **3 Claims**

1. In an electron gun comprising (a) a directly heatable first cathode; (b) a second, blocking cathode, mounted in front of said first cathode and indirectly heated thereby; (c) a carrier ring having a coaxial centering surface; (d) a plurality of separated, supporting braces connecting said blocking cathode with said carrier ring; and (e) a removeable external Wehnelt electrode having a central opening for passing focused electrons, said blocking cathode being mounted coaxially relative to said central opening of said Wehnelt electrode,

the improvement wherein said Wehnelt electrode and said carrier ring have mating centering surfaces; wherein said blocking cathode, said supporting braces and said carrier ring form a structural unit which may be inserted in said Wehnelt electrode from the side thereof facing said first cathode; thus requiring no assembly or fixture to any other part of the whole system and wherein said electron gun further comprises a removeable locking ring for clamping said carrier ring against said Wehnelt electrode with said centering surfaces in mating relationship, whereby said



structural unit may be assembled separately with said blocking cathode fixed in position with respect to said carrier ring, and said carrier ring may thereafter be clamped into position on said Wehnelt electrode with said blocking cathode in alignment with said central opening.

4,803,399

FLUORESCENT LAMP ARRANGEMENT FOR UNIFORMLY ILLUMINATING A DISPLAY PANEL

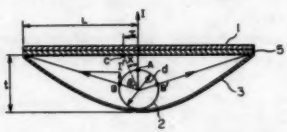
Soichiro Ogawa, Tokyo, and Toshihiko Sano, Ome, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 893,818, Aug. 6, 1986, abandoned. This application May 23, 1988, Ser. No. 198,600

Claims priority, application Japan, Aug. 14, 1985, 60-177517

Int. Cl.[4] H01J *61/42, 61/35;* G02F *1/13*

U.S. Cl. 313—493 **26 Claims**



1. A fluorescent lamp arrangement for uniformly illuminating a display panel having two parallel side edges, comprising:

a fluorescent lamp having a glass tube having a center axis and two opposite ends and provided with electrodes at said opposite ends, a fluorescent layer formed over an inner surface of said glass tube, and mercury and a rare gas sealed in said glass tube; and

a light-shading patterned layer formed on a circumferential part of a surface of said glass tube so as to effect a substantially uniform luminance on said display panel when said fluorescent lamp is mounted in a predetermined positional relationship with the display panel such that said display panel is parallelly disposed to the center axis of said glass tube and illuminated through said light-shading patterned layer by said fluorescent lamp, said circumferential part facing the display panel when said fluorescent lamp is mounted and wherein said part is defined as that part of said surface between two lines on said surface defined by a radial intersection of imaginary planes therethrough, each plane including said center axis and a respective one of said side edges thereby effecting in substantially uniform distribution of luminance comfort at viewing angles other than perpendicular to the display panel.

4,803,400
PRE-WATER-BASED SUSPENSION PHOSPHOR TREATMENT PROCESS

Thomas E. Peters, Chelmsford, and Roger B. Hunt, Jr., Medfield, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 2, 1987, Ser. No. 10,078
Int. Cl.[4] H01J 63/04
U.S. Cl. 313—489 11 Claims

1. A pre-water-based suspension phosphor treatment method comprising the following steps:

Step 1—annealing a phosphor having a protective oxide coating at about 700° C. to about 850° C. and for a period of about 15 minutes to about 20 hours to preclude adversely affecting said protective oxide coating on said phosphor during subsequent water-based suspension processing and to preclude detrimentally altering said phosphor to form an annealed phosphor;

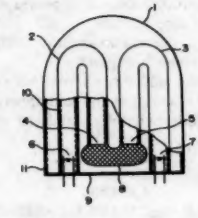
Step 2—cooling the annealed phosphor from step 1 to form a cooled annealed phosphor; and

Step 3—adding the cooled annealed phosphor from step 2 to a water-base suspension.

4,803,401
COMPACT FLUORESCENT LAMP

Hiromitsu Matsuno, Hachioji; Tetsuo Ono, and Seiichi Murayama, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 16, 1986, Ser. No. 886,238
Claims priority, application Japan, Jul. 19, 1985, 60-158177
Int. Cl.[4] H01J 61/35, 61/42
U.S. Cl. 313—489 11 Claims

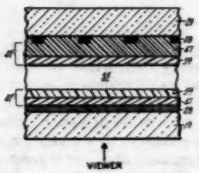


1. A compact fluorescent lamp comprising an airtight outer bulb filled with a rare gas and mercury, inner tube means provided within said outer bulb, said inner tube means having opening to a space of the inside of said outer bulb, said inner tube means including therein electrodes spaced apart from each other, the inner tube means having an inner surface, the inner surface of the inner tube means being coated with phosphor material; and a coating formed on at least one of an inner surface of said outer bulb and an outer surface of each of said inner tube means, said coating being so transparent as substantially not to scatter visible rays and which consists of at least one material selected from the group consisting of an oxide and a phosphate, visible rays produced in said lamp not being substantially scattered or diffused by the lamp, whereby reduction in lumen output maintenance in the course of time is avoided while providing an initial lumen output that is not lowered as compared to that of a lamp without said coating.

4,803,402
REFLECTION-ENHANCED FLAT PANEL DISPLAY

Peter E. Raber, Milford, and Robert E. Wisnieff, Weston, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 643,206, Aug. 22, 1984, abandoned.
This application Apr. 14, 1987, Ser. No. 38,440
Int. Cl.[4] H01J 17/49; H05B 33/02
U.S. Cl. 313—509 14 Claims



1. A flat display panel for displaying a predetermined pattern of light in response to an alternating applied electric field comprising:

light means for producing light in response to the application of said alternating applied electric field;

a first plurality of parallel electrodes for establishing selected electric fields, said first plurality of electrodes being disposed on a rear side of said light means;

a second plurality of parallel electrodes for cooperating with said first plurality in the establishment of said selected electric fields, said second electrode plurality being disposed on a front side of said light means and being parallel to the plane of said first electrode plurality, said electrodes of said second plurality being generally orthogonal to said first plurality of parallel electrodes;

front and rear dielectric charge storage layers, disposed respectively between said first and second pluralities of parallel electrodes and said light means, whereby said applied electric field passes through said front and rear dielectric charge storage layers, said front charge storage layer being substantially transparent, characterized in that:

said rear dielectric charge storage layer includes at least one pair of rear dielectric sublayers of different index of refraction extending over said first plurality of parallel electrodes, each sublayer having an optical thickness of one-quarter wavelength of a predetermined optical wavelength in said visible spectrum, said optical thicknesses and indices of refraction being such that said pair of rear dielectric sublayers cooperate to provide increased reflectivity in said visible spectrum, whereby said at least one pair of rear dielectric sublayers is subjected to said applied alternating electric field and said near dielectric charge storage layer performs both the functions of isolating said first plurality of electrodes from one another and storing charge and of reflecting light from said light means through said front dielectric charge storage layer.

4,803,403

END SEAL FOR CERAMIC ARC DISCHARGE TUBES

Francis B. Makar, Jr., Plaistow, and George A. Fryburg, Hampton, both of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 528,716, Sep. 2, 1983, abandoned. This application Aug. 3, 1987, Ser. No. 88,461
Int. Cl.[4] H01J 61/36
U.S. Cl. 313—624 4 Claims

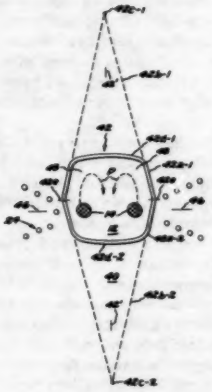
1. A hermetically sealed ceramic arc tube comprising: an elongated, substantially cylindrical, tubular body having an outside diameter, an inside diameter, and opposite ends each end having an end face, wherein, at a location adjacent each of said opposite ends, said inside diameter widens in a direction toward each of the end faces to a maximum diameter at each said end face which maxium diameter is greater than said inside diameter and less than said outside diameter to form a chamfer, and a sealing disc sealed into each of said ends, said sealing disc having a frusto-conical portion formed to mate with said chamfer and a circumferential flange formed to mate with the end face of said body, said circumferential flange having a diameter equal to said outside diameter.

4,803,404

ENVELOPE FOR SMALL HIGH-INTENSITY-DISCHARGE ELECTRODELESS ARC LAMP

John M. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,006
Int. Cl.[4] H01J 61/33; H05B 41/24
U.S. Cl. 313—634 11 Claims



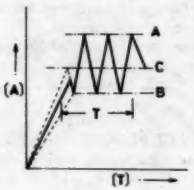
1. An envelope of substantially transparent material for containing a gaseous arc-sustaining medium, comprising: a central portion formed of first and second slanted sidewalls each having a shape generally defined by a section of a cone having an apex located outside of said envelope and upon an opposite side of said envelope from the apex for the other one of the pair of sidewalls, each of said conical sections being truncated by opposed first and second endplanes, said first endplanes being larger than said second endplanes, and with the first endplanes of both of the first and second sidewalls being hermetically joined to each other; a first end portion substantially hermetically enclosing the second endplane of the first sidewall; and a second end portion substantially hermetically enclosing the second endplane of the second sidewall.

4,803,405

PLASMA PROCESSING APPARATUS AND METHOD

Etsuo Nakano, Sakura; Akira Furujo, Funabashi, and Tetsuya Iizuka, Tokyo, all of Japan, assignors to Koike Sanso Kogyo Co., Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 40,565
Claims priority, application Japan, Apr. 18, 1986, 61-88076
Int. Cl.[4] B23K 9/00
U.S. Cl. 315—111.21 7 Claims



5. A method of starting a plasma processing system, which system comprises a dc plasma torch having a nozzle electrode, a central electrode, and means for introducing at least one gas therebetween, the method comprising the steps of:

generating an initial arc between said central electrode and said nozzle electrode from a d.c. power supply, to ignite said at least one gas;

increasing the d.c. current associated with said arc to a predetermined upper limit; and

periodically varying said d.c. current between a predetermined non zero lower limit and said upper limit for a fixed number of periods, whereby stabilized starting is facilitated.

4,803,406

HIGH-PRESSURE DISCHARGE LAMP OPERATING CIRCUIT

Makoto Yasuda, Kodaira; Tsune Miyashita, Tokyo; Seiichi Murayama, Kokubunji; Yoji Arai, Ome, and Fuzio Yamada, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1985, Ser. No. 795,268
Claims priority, application Japan, Nov. 5, 1984, 59-231413
Int. Cl.[4] H05B 37/00
U.S. Cl. 315—174 15 Claims

8. A high-pressure discharge lamp operating circuit, comprising:

discharge ignition means for igniting a discharge between main electrodes of an arc tube;

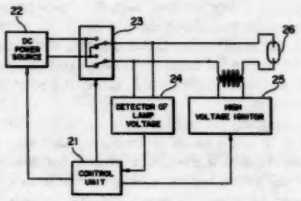
first power supply means for supplying low-frequency AC power to the arc tube for placing an arc spot on the desired position of each of said main electrodes after said arc tube has been ignited;

second power supply means for supplying a DC power or a high-frequency AC power to said arc tube;

power switching means for selectively connecting said first

power supply means or said second power supply means to said arc tube; and

control means for controlling said power switching means to connect said first power supply means to said arc tube after said arc tube has been ignited and until said arc spot has been placed with full contact on a desired position of each of said main electrodes and to disconnect said first



power supply means and connect said second power supply means to said arc tube before the arc spot changes to minute contact on the tip of the main electrodes, including detecting means for detecting a condition which occurs prior to steady-state operation of said arc tube, said power switching means being operated by an output signal from said detecting means upon detecting said condition.

4,803,407

DIGITAL HORIZONTAL-DEFLECTION CIRCUIT

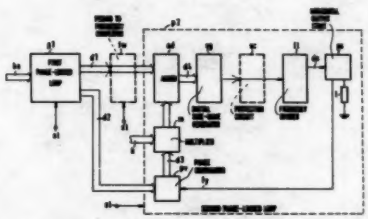
Soenke Mehrgardt, March, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Jul. 16, 1987, Ser. No. 74,283

Claims priority, application European Pat. Off., Jul. 31, 1986, 86110576.5

Int. Cl.[4] H01J *29/70, 29/72*

U.S. Cl. 315—364 **4 Claims**



1. A digital horizontal-deflection circuit for generating an analog horizontal deflection signal driving the horizontal output stage of a digital television receiver clocked with a system clock, comprising:

a first digital phase-locked loop which synchronizes the horizontal deflection signal with the horizontal synchronizing signal separated from the composite color signal and delivers for each line of video signal a first digital word representative of the horizontal frequency and a second digital word representative of the desired phase position of the horizontal flyback signal;

a second phase-locked loop which uses a digital phase comparator to generate a third digital word representative of the phase deviation of the horizontal flyback signal from the desired position and shifts the horizontal deflection signal in time so that the horizontal flyback signal takes up the desired phase position;

an adder having a first input to which said first digital word is fed and a second input to which said third digital word is fed via a multiplier serving as an amplifier;

a digital sine-wave generator having a control input to which the output of said adder is fed; and

a frequency divider to which the output of said digital sine-wave generator is supplied, the output of said frequency divider providing the horizontal deflection signal.

4,803,408

BRUSHLESS DC MOTOR SYSTEM WITH OPTICALLY SCANNABLE MEMBER FOR COMMUTATION

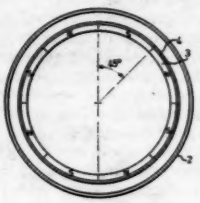
Dietmar Uhde, Königsfeld; Günter Gleim, AVS-Villingen; Hartmut Schandl, Villingen; Peter Hoch, Triberg, and Rüdiger Lehmann, St. Georgen, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Feb. 11, 1987, Ser. No. 13,435

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1986, 3604238

Int. Cl.[4] H02K *29/10*

U.S. Cl. 318—254 **11 Claims**



1. A brushless DC motor system, comprising:

a DC motor which includes a plurality of stator coils to receive commutation current, a rotatable member having an optically scannable code, and a plurality of permanent magnets, fixedly positioned with respect to the scannable code, mounted along a circular path in the rotatable member opposite the coils so that the coils and magnets are spaced apart by gaps;

fixed scanner means with respect to the stator coils for scanning the code to generate scanner signals having phase positions; and

control means for evaluating the scanner signals with respect to their phase positions to determine the moment of commutation, and for supplying the commutation current to the coils,

wherein the motor requires n commutation steps during each revolution, n being an integer greater than 1,

wherein the rotatable member is composed of a rotationally symmetrical light-transmitting plastic element which includes a ring with an edge bearing the scannable code, the scannable code including a plurality of light-impermeable equidistant zones on the ring, the light-impermeable zones being distributed around the circumference of the ring, each light-impermeable zone corresponding to respective commutation step, and

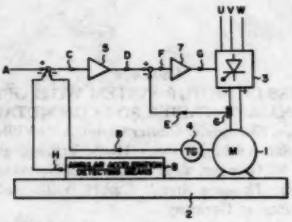
wherein there are n-1 first light-impermeable zones and one second light-impermeable zone, the second light-impermeable zone being shaped differently than the first light-impermeable zones.

4,803,409

ACCELERATION SIGNAL CORRECTED MOTOR SPEED CONTROL SYSTEM

Kazuo Horikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co. Ltd., Minamiashigara, Japan

Continuation of Ser. No. 811,320, Dec. 19, 1985, abandoned, which is a continuation of Ser. No. 578,646, Feb. 9, 1984, abandoned. This application Jun. 1, 1987, Ser. No. 55,886
Claims priority, application Japan, Feb. 10, 1983, 58-19838
Int. Cl.[4] H02P 5/00
U.S. Cl. 318—310 8 Claims



1. In combination with means for controlling the speed of a motor supported on a supporting base the position of which is changed during operation, said motor having a shaft,

input command means for inputting a speed signal representing a desired speed of the motor;

sensing means for generating an actual speed signal representing the actual speed of said motor;

detecting means responsive to angular acceleration of said supporting base in directions perpendicular to the motor shaft, caused by changes in position of said supporting base for correcting said speed signal in accordance with an angular acceleration signal representing said detected angular acceleration of said supporting base;

comparison means comparing said speed signal corrected by the angular acceleration signal with said actual speed signal for outputting a speed error signal representing differences between the signals compared; and

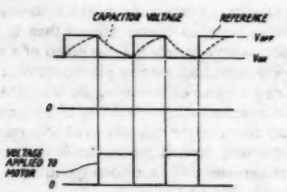
signal transmitting means operatively connecting the comparison means to the speed controlling means for substantially eliminating adverse disturbances of the rotational speed of the motor caused by the changes in the position of the supporting base.

4,803,410

VARIABLE DUTY RATIO SPEED CONTROLLER FOR DC MOTORS

Shigeru Shinohara, and Shun Suzuki, both of Katsuta, Japan, assignors to Hitachi Koki Company, Ltd., Japan

Filed Feb. 7, 1986, Ser. No. 827,194
Int. Cl.[4] G05B 5/00
U.S. Cl. 318—331 11 Claims



1. A speed controller for a DC motor comprising:

a semiconductor switching device connected in series with said motor and responsive to a switching control signal applied thereto for switching power to said motor from a voltage source on and off, whereby a current having an amplitude proportional to the amount of load on said motor flows in said motor when said power is switched on and a counter-electromotive force inversely proportional to said motor load is generated by said motor when said power is switched off; and

switching control means responsive to the amplitude of said current and said counter-electromotive force for generating said switching control signal which turns on said semiconductor switching device for a duration proportional to the amplitude of said current and turns off said switching device for an interval proportional to said counter-electromotive force, said switching control means comprising:

a time constant circuit including a capacitor connected in parallel with said switching device so that said switching device establishes a discharge circuit for said time constant circuit when the switching device is turned on and allows said capacitor to develop a first voltage when the switching device is turned off;

a variable reference source for generating a reference voltage variable between high and low values in response to said switching control signal; and

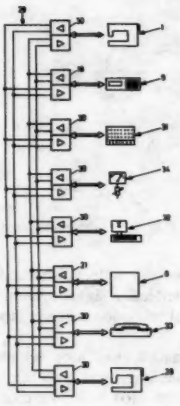
means for comparing said first voltage with said variable reference for generating an output selectively having high and low voltage levels dependent on the relative value of said first voltage to said variable reference and applying said output to said switching device and to said variable reference source as said switching control signal.

4,803,411

INDUSTRIAL SEWING MACHINE

Bernd Olbrich, Ketsch, Fed. Rep. of Germany, assignor to Frankl & Kirchner GmbH & Co. KG, Schwetzingen/Baden, Fed. Rep. of Germany

Filed Sep. 28, 1987, Ser. No. 101,588
Int. Cl.[4] G08C 19/16
U.S. Cl. 318—564 2 Claims



1. An industrial sewing machine comprising:

a main shaft which can be driven by an electric motor drive;

a positioner disposed on the main shaft;

a regulating and control system controlling the electric motor drive in accordance with the positioner;

an operating and display system; and

an interfacing system for providing a connection between the regulating and control system, the operating and display system and additional components;

the interfacing system including, for the transmission back

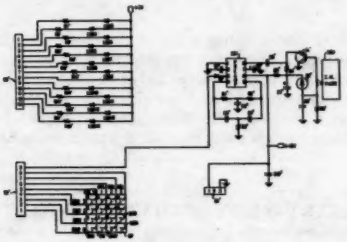
and forth of signals between n connected components, two lines for each of the n connected components, each of the n components including an output having a driver stage with a system for inverting the signal to be transmitted and an output for transmitting a non-inverted signal; said inverted signal and said non-inverted signal being transmitted via one line each, and each of the n components further including a difference detector, having two inputs connected to each said line, for forming the difference between the inverted and non-inverted signals.

4,803,412

PROGRAMMABLE ELECTRONIC ANTENNA ROTATOR

Larry W. Burton, Hurdle Mills, N.C., assignor to Avnet, Inc., Ellenville, N.Y.

Filed Jun. 30, 1987, Ser. No. 68,634
Int. Cl.[4] G05B *19/10*
U.S. Cl. 318—567 **11 Claims**



1. In a system for automatically rotating an antenna to any one of a plurality of preprogrammed positions via operation of either different ones or combinations of keys of a keypad, the preprogramming method for said system comprising the steps of:

(A) synchronizing said system to a datum position via rotation of said antenna to a known reference position;

(B) manually operating said system via said keypad for rotating said antenna to stop at a desired position;

(C) storing in memory via operating of said keypad the desired position of said antenna for subsequent automatic selection;

(D) repeating steps (B) and (C) for storing in memory each one of said plurality of preprogrammed positions;

(E) selecting from memory via said keypad one of said preprogrammed positions;

(F) automatically rotating said antenna to the selected preprogrammed position under control of said microprocessor; and

(G) detecting a signal from a remote control device for manually operating said system to rotate said antenna to a desired position.

4,803,413

MAGNETIC ISOLATING AND POINTING GIMBAL APPARATUS

John R. Kendig, Peoria; William R. Hibble, and James A. Kiedrowski, both of Phoenix, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 15, 1986, Ser. No. 885,627
Int. Cl.[4] B64C *17/02*
U.S. Cl. 318—648 **19 Claims**

1. A magnetic isolation and pointing gimbal apparatus, comprising:

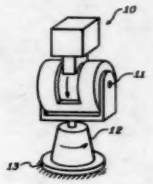
a housing;

a shaft rotatably mounted in the housing and having a centroidal axis extending coaxially within the housing;

a linear, two-axis, large gap, radial magnetic actuator mounted in the housing concentically with the shaft;

a radial armature mounted on the shaft adjacent the radial magnetic actuator;

a set of linear, lrge gap, axial magnetic actuators mounted in the housing;



an axial armature connected to the shaft and extending between the axial magnetic actuators;

a torque motor connected to the shaft; and

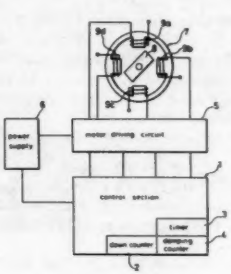
a large gap, rotational position sensor having a first portion connected to the shaft and a second portion connected to the housing.

4,803,414

METHOD OF CONTROLLING A STEP MOTOR

Mikio Kato, Aichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 19, 1987, Ser. No. 87,036
Claims priority, application Japan, Aug. 20, 1986, 61-194942
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **4 Claims**

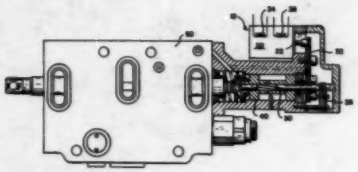


1. A method of controlling a step motor for halting and positioning a rotor of said step motor at a predetermined position by applying a driving voltage and a holding voltage lower than the driving voltage to a plurality of stator coils in the following order: (1) applying said driving voltage to a final magnetization phase for a first predetermined time period, (2) applying said holding voltage to the final magnetization phase for a second predetermined time period to minimize an oscillatory motion of said rotor, (3) applying said driving voltage again to said final phase for a third predetermined time period, and (4) applying said holding voltage to said final phase for a fourth predetermined time period, whereby the rotor is halted and positioned at the final magnetization phase.

4,803,415
STEPPER MOTOR CONTROL CIRCUIT AND APPARATUS

Paul A. Sepesy, Youngstown, Ohio, assignor to Commercial Shearing, Inc., Youngstown, Ohio

Filed Oct. 7, 1987, Ser. No. 106,059
Int. Cl.[4] H02P 8/00
U.S. Cl. 318—696 26 Claims



1. A motor control circuit and apparatus for controlling an electrical motor having a rotatable shaft adapted to rotate incrementally clockwise or counterclockwise in response to electrical currents applied to the motor comprising:

(a) input means including command signal input means for receiving an electrical command signal and power input means for receiving a sufficient electrical current to energize the control circuit and motor;

(b) clock means for providing periodic electrical clock signal pulses to the control circuit;

(c) up/down counter means electrically connected to said clock means for counting clock pulses on each clock signal pulse and for providing an output signal in the form of a binary representation of total clock pulses;

(d) comparing circuit means electrically connected to the up/down counter means and to the command signal input means for determining an up/down direction of the up/down counter before each clock signal pulse so that the up/down counter counts in a single direction until the binary representation of total counts is equivalent to an incremental count nearest beyond the input command signal and thereafter oscillates between an incremental count at least one count nearest above and an incremental count at least one count nearest below said input command signal; and

(e) decoder means connected to the up/down counter and adapted to be connected to the motor for transmitting electrical currents to the motor to cause the shaft to rotate to and oscillate about a commanded average rotational position responsive to the binary representation of total counts of the up/down counter.

4,803,416
STORAGE BATTERY CONTROL DEVICE

Jacques Abiven, Coat Mael, Vieux Marché22420 Plouaret, and Eric Andrain, C341 Kervoalan, 22700 Perros Guirec, all of France

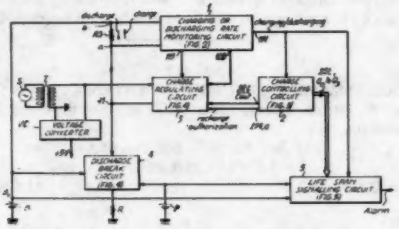
Filed Aug. 20, 1986, Ser. No. 898,392
Claims priority, application France, Aug. 23, 1986, 85 12679
Int. Cl.[4] H02J 7/04; G01R 11/66
U.S. Cl. 320—44 7 Claims

1. A control device for a storage battery, comprising

(a) means for supplying clock pulses having a variable frequency proportional to a battery charge and discharge current, said clock pulse supplying means being responsive to an estimation of charge energy efficiency and to an estimation of a self-discharge current of the battery, said self-discharge current estimation being a function of temperature;

(b) means for estimating an instantaneous capacity of the battery depending on a clock pulse up-down count;

(c) means including a supply voltage for recharging the battery as soon as said instantaneous capacity is less than a first capacity below the maximum capacity of the battery and as long as the instantaneous capacity differs from a second capacity substantially equal to said maximum capacity and more than said first capacity, said recharging means including means controlled by said estimating means for monitoring said charge current depending on the amplitude of said charge and discharge current and on temperature; and

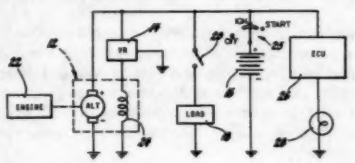


(d) means for evaluating aging of the battery by counting pulses having a variable frequency depending on ambient temperature, on said charge and discharge current, and on said estimated instantaneous capacity of the battery, thereby producing an alarm signal when said variable frequency pulses reach in number a predetermined value.

4,803,417
VEHICLE BATTERY DISCHARGING INDICATOR

Robert J. Nowakowski, Indianapolis, and Van V. Riesberg, Jr., Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1986, Ser. No. 944,753
Int. Cl.[4] H02J 7/16
U.S. Cl. 320—48 6 Claims



1. In a motor vehicle powered by an internal combustion engine including a storage battery having an open-circuit emf dependent upon battery conditions, an electrical load, and a unidirectional current source supplying current to the parallel combination of the battery and the load, the current source normally providing sufficient current to the battery and the load to impress upon the battery a voltage greater than the open-circuit emf of the battery thereby causing the battery to charge, wherein the battery discharges when the voltage impressed upon the battery is below the open-circuit emf of the battery, a method of indicating when the battery is discharging, comprising the steps of:

a. measuring a first voltage of the battery before cranking the engine each time the engine is started;

b. storing the first voltage as a reference voltage value, the reference voltage value representing the open-circuit emf of the battery compensated for the battery conditions existing when the first voltage is measured;

c. measuring a second voltage of the battery after the engine is started, the second voltage having a value less than the open-circuit emf of the battery when the battery is discharging;

d. comparing the second voltage with the stored reference voltage value; and

e. indicating that the battery is discharging when the second voltage is less than the reference voltage value.

4,803,418

IN-LINE ELECTRICAL SWITCH FOR AC POWER SUPPLY

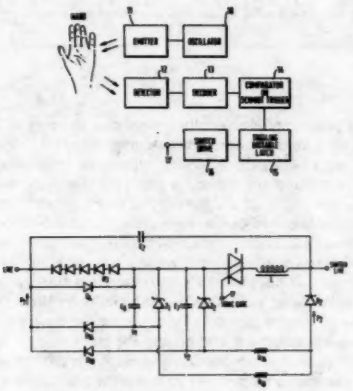
Gordon S. Ritchie, 44B Gore Road, Victoria Park, Hackney, London, England E9 7HP

Filed Aug. 28, 1987, Ser. No. 90,579

Claims priority, application United Kingdom, Sep. 2, 1986, 8621209; Feb. 23, 1987, 8704151

Int. Cl.[4] H03K *17/945*

U.S. Cl. 323—324 **25 Claims**



1. An electrical switch comprising:

a line terminal;

a switch terminal;

switching means for controlling current flow between the line terminal and the switch terminal;

switch control means for controlling the state of the switching means;

first impedance means for generating a voltage drop across itself connected in series between said line terminal and said switching means;

first and second power supply means for providing power respectively to a first part and a second part of the control means, such first and second power supply means each including charge storage means for holding a charge, the charge storage means having a first charge storage terminal and a second charge storage terminal, the first charge storage terminal being connected to the series connection between the switching means and the first impedance means, the charge storage means being charged, when the switching means is conductive, by a first current path which flows from the second charge storage terminal to the line terminal in cooperation with the potential across the first impedance means, and being charged, when the switching means is nonconductive, by a second current path which flows from the second charge storage terminal to the switch terminal in cooperation with the potential across the switching means.

4,803,419

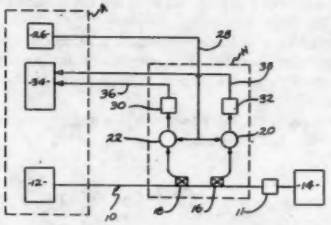
TESTING HEAD DEVICE FOR A MICROWAVE NETWORK ANALYZER

Mark D. Roos, San Carlos, Calif., assignor to EIP Microwave, Inc., San Jose, Calif.

Filed Oct. 1, 1986, Ser. No. 914,039

Int. Cl.[4] G01R *27/04*

U.S. Cl. 324—58 R **5 Claims**



1. A remote testing head for use with an apparatus for analyzing microwave devices including means for generating microwave frequency signals and local oscillator means for generating a local oscillator signal, said test head being adapted to be connected directly to a microwave device under test and comprising:

means on said test heads for connecting said test head to said DUT at a point remote from said analyzing apparatus;

coupler means in said test head for sampling said microwave frequency test signal and microwave signals reflected from said DUT;

mixer means in said test head coupled to said coupler means for mixing said sampled microwave signals with said signal from said local oscillator, thereby generating an intermediate frequency (IF) signal which includes information about the characteristics of said DUT; and

cable means interconnected between said analyzing apparatus and aid test head for transmitting said microwave frequency test signals and said local oscillator signal from said analyzing apparatus to said test head and said IF signals from said test heat to said analyzing apparatus.

4,803,420

METHOD OF DETERMINING THE POSITION OF THE TAP ON A RESISTANCE TELETRANSMITTER

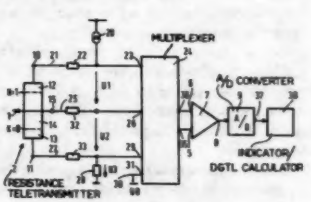
Jürgen K. Steinbrecher, Melsungen, and Ulrich Schnell, Baunatal, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Oct. 7, 1987, Ser. No. 106,076

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 3634051

Int. Cl.[4] G01R *27/14*

U.S. Cl. 324—64 **10 Claims**



1. A method of determining the position k of a tap on a resistance teletransmitter including two fixed resistance ranges, between which an effective resistance range is provided, in which the tap is adjustable, while a first connection of the

resistance teletransmitter is connected to a current source and can be connected through a first conductor to an instrument amplifier, its tap constituting a central connection being connected to a second conductor and its second connection can be connected through a third conductor to the instrument amplifier, the method comprising:

(a) determining a voltage U1 between the first conductor and the second conductor that can also be connected to the instrument amplifier,

(b) determining a voltage U2 between the second conductor and the third conductor,

(c) recording a voltage U3 across a reference resistor Rs located between the third conductor and zero potential for determining the current flowing through the conductors, and

(d) calculating the tap position k in a digital computer with reference to the equation

$$k = \frac{U2 - U1}{U3} K1 + K2$$

with the constants

$$K1 = \frac{Rs}{2R} \text{ and } K2 = \frac{1}{2} + \frac{R1 - R2}{2R}$$

where $0 \leqq k \leqq 1$ and R1 and R2 are the resistance values of the fixed resistance ranges and R is the resistance value of the effective resistance range.

4,803,421

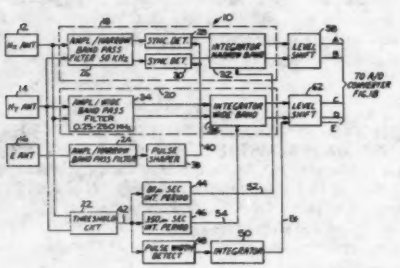
MULTI INPUT LIGHTNING DETECTION SYSTEM

Kenneth A. Ostrander, Columbus, Ohio, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 19, 1988, Ser. No. 145,276

Int. Cl.[4] G01R 29/08; G01W 1/16

U.S. Cl. 324—72 **11 Claims**



1. An apparatus for determining geographic locations of electrical disturbances generated by weather phenomena relative to an observation location, comprising

means for independently receiving signals generated by said electrical disturbances which are indicative of the direction from the observation location to the location of the disturbance and which are related to at least two separate components of electromagnetic fields associated with such disturbances,

means for isolating from said received signals a first component, the intensity of which is an inverse function of one of three variables consisting of the distance between the discharge and the observation location, the square of said distance and the cube of said distance, and for isolating a second component the intensity of which is an inverse function of one of the other two variables,

means for simultaneously combining said first and second components and for deriving a range signal therefrom which is indicative of said distance, and

means responsive to said direction indicative received signals for deriving a direction signal, whereby said range and direction signals may be used to control display means to provide a map-like display of the location of said disturbances relative to said observation location.

4,803,422

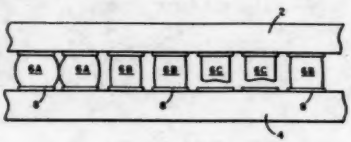
ELECTRICAL MONITORING OF FLIP-CHIP HYBRIDIZATION

John J. Ignatowski, Warren, Mich., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Dec. 28, 1987, Ser. No. 138,161

Int. Cl.[4] G01R 31/28; H01L 21/66

U.S. Cl. 324—73 R **10 Claims**



1. In a process of electrically connecting an array of photosensors to a one-to-one corresponding array of capacitive sensors, each photosensor having a parasitic resistance, each capacitive storage cell having a parasitic resistance which is generally an order of magnitude or more greater than the parasitic resistance of its corresponding the photosensor, each connection if successfully made placing the parasitic resistance of a photosensor in electrical parallelism with the parasitic resistance of said photosensor's corresponding storage cell, the storage cells being individually readable as to their electrostatic charge level, a method of monitoring the electrical continuity of the connections comprising the steps:

(a) performing the connection process in the dark relative to the photosensors in order to minimize photocurrent,

(b) electrostatically charging the storage cells to a known level,

(c) waiting a period of time for some discharge ot the storage cells, the period being sufficient for there to be distinguishable differences between the charge levels of unconnected storage cells and the charge levels of connected storage cells, but not long enough for a full discharge of an unconnected storage cell,

(d) reading the electrostatic charge level of each storage cell, and

(e) deriving from the reading an indication of the number of unconnected storage cells.

4,803,423

INPUT CIRCUIT FOR A PROBE OF A LOGIC ANALYSER AND PROBE AND LOGIC ANALYSER PROVIDED WITH SUCH A CIRCUIT

Pierre-Henri Boutigny, Epinay-sous-Senart, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed May 28, 1987, Ser. No. 55,659

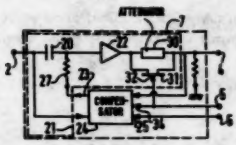
Claims priority, application France, Jun. 6, 1986, 86 08185

Int. Cl.[4] G01R 19/06, 19/00

U.S. Cl. 324—130 **12 Claims**

1. An input circuit for a probe of a logic analyzer for high frequency logic signals comprising: a high-frequency amplifier coupled between an input terminal and an output terminal, said high-frequency amplifier having a high input impedance, an amplification less than one, and an output which supplies an output signal to a low impedance arranged between the output terminal and ground, characterized in that a capacitance is

connected between the input terminal of the circuit and an input of the amplifier, and a compensation circuit is coupled in parallel between the input and output terminals for comparing a deviation between low-frequency d.c. components of respective signals occurring at the input and output terminals and



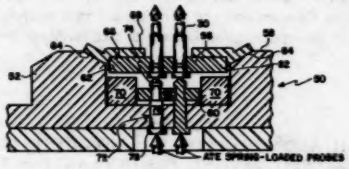
supplying a compensation signal intended to compensate for said deviation to the input of the amplifier by means of an injection element, the compensation circuit having an input controlled by a d.c. signal subject to a given offset in order to compensate for the d.c. component.

4,803,424

SHORT-WIRE BED-OF-NAILS TEST FIXTURE

Joseph A. Ierardi, North Attleboro, and Wayne S. Alden, III, Whitman, both of Mass., assignors to August Inc., Mansfield, Mass.

Filed Aug. 31, 1987, Ser. No. 91,593
Int. Cl.[4] G01R 1/04, 1/073
U.S. Cl. 324—158 F **16 Claims**



1. A short wire bed-of-nails vacuum-operated test fixture for use in combination with automatic testing equipment to test an electronic circuit device having a plurality of test points disposed in a predetermined configuration on one major surface thereof, vacuum pressure applied to said short wire bed-of-nails vacuum-operated test fixture acting on the one major surface of the electronic circuit device to removably retain the electronic circuit device in contact with said short wire bed-of-nails vacuum operated test fixture by means of atmospheric pressure acting on the other major surface of the electronic circuit device, the automatic testing equipment including spring-loaded probe means for mechanically and electrically engaging said short wire bed-of-nails vacuum-operated test fixture, said short wire bed-of-nails vacuum-operated test fixture comprising:

test head assembly means for removably retaining the electronic circuit device to be tested, said test head assembly means including

electrical contact means for wire wrapping disposed in a predetermined configuration corresponding to the predetermined configuration of test points on the one major surface of the electronic circuit device to be tested, and

means for resiliently contacting the predetermined configuration of test points of the electronic circuit device with vacuum pressure applied to said short wire bed-of-nails vacuum-operated test fixture;

short wire interface assembly means for interfacing with the automatic testing equipment and said electrical contact means of said test head assembly means to apply electrical test signals from the automatic testing equipment to the electronic circuit device to be tested said short wire interface assembly means including

cover plate means for interfacing with the automatic testing equipment, said cover plate means having a plurality of cavities formed therein,

interface contact means for wire wrapping with said electrical contact means of said test head assembly means to provide electrical continuity between said test head assembly means and said short wire interface assembly means,

rotatable interface strip means suspended in said plurality of cavities for captively retaining said interface contact means, said rotatable interface strip means sealingly engaging said cover plate means with vacuum pressure applied to said short wire bed-of-nails vacuum-operated test fixture, and

means disposed in said cover plate means and extending into said plurality of cavities for providing mechanical and electrical interfacing between said interface contact means and the spring-loaded probe means and for limiting initial loading effects exerted by the spring-loaded probe means with vacuum pressure applied to said short wire bed-of-nails vacuum-operated test fixture to maintain said rotatable interface strip means in sealing engagement with said cover plate means; and

short interconnect wire means for wire wrapping between said electrical contact means of said short wire interface assembly means and said interface contact means of said test head assembly means to provide electrical continuity between said test head assembly means and said short wire interface assembly means; wherein

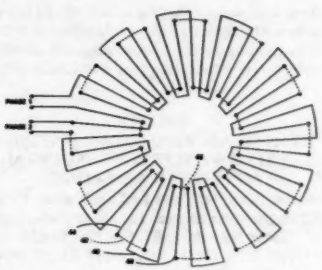
said rotatable interface strip means is rotated approximately one hundred and eighty degrees to effect wire wrapping between said electrical contact means and said interface contact means and is reversely rotated approximately one hundred and eighty degrees for suspension in said plurality of cavities and sealing engagement with said cover plate means.

4,803,425

MULTI-PHASE PRINTED CIRCUIT BOARD TACHOMETER

Melvin E. Swanberg, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 5, 1987, Ser. No. 104,726
Int. Cl.[4] G01P 3/48, 3/487
U.S. Cl. 324—173 **1 Claim**



1. A printed circuit winding pair for use in AC tachometers comprising:

a first winding on a board substrate, said winding having a first terminal and a second terminal, a continuous conductive trace from said first terminal to said second terminal, said trace following a generally serpentine pattern, said pattern being circular in shape, such that said serpentine

pattern comprises radial loops extending outwardly from a central point,

a second winding on said board substrate, said second winding having a first terminal and a second terminal, a continuous conductive trace from said first terminal to said second terminal, said trace following a generally serpentine pattern, said pattern being circular in shape, such that said serpentine patterns comprises radial loops extending outwardly from a central point,

said second winding being rotated slightly from and interwined with said first winding, wherein the outer circular parts of said first winding is formed on the reverse side of said board substrate and connected to the radial traces of said first winding by plated through holes, and wherein the inner circular parts of said secured winding is formed on the reverse side of said board substrate and connected to the radial traces of said second winding by plated through holes, such that said first and second windings are electrically isolated from each other.

4,803,426

MAGNETIC TILT SENSOR

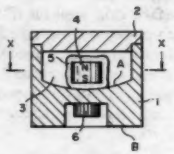
Yoshimoto Odagawa; Yasuo Tamagawa, and Hiraku Imaizumi, all of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 16, 1987, Ser. No. 74,249

Claims priority, application Japan, Jul. 21, 1986, 61-169930

Int. Cl.[4] G01B 7/14

U.S. Cl. 324—207 **4 Claims**



1. A magnetic tilt sensor comprising:

a nonmagnetic case having a space therein,

a permanent magnet housed to freely movable in said space,

a magnetic fluid attracted to said permanent magnet, said magnetic fluid being of an amount sufficient to substantially cover an entire surface of said permanent magnet, and

a magnetic sensing element fixed to said case in opposing relation to said space,

wherein said permanent magnet is moved to a lower position of the space by reason of its weight when said case is tilted so that magnetic sensed by said magnetic sensing element changes, thereby detecting that said case is tilted.

4,803,427

PRECISION MEASURING GAUGE HAVING SONIC DELAY LINE WITH FREE-STANDING MODE CONVERTER ARMATURE

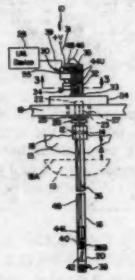
Roy G. Mason, Sunnyvale, and Leif Andreasen, Fremont, both of Calif., assignors to Amcon, Inc., Sunnyvale, Calif.

Filed May 26, 1987, Ser. No. 53,620

Int. Cl.[4] G01B 7/26; H03H 9/22; G01F 23/30; H04B 11/00

U.S. Cl. 324—207 **8 Claims**

1. In a linear distance measuring device having an electrically conductive sonic delay line, a permanent magnet movable along the delay line, a coil, a pulse generator for supplying electrical pulses to said coil, and circuit means connected to the delay line and the pulse generator; the combination therewith of mode converter comprising a free-standing magnetostrictive armature having a first end thereof rigidly attached to the periphery of the delay line at a point thereon spaced from the magnet, and having an other end therof terminating dampingly within said coil, a first portion of said armature adjacent said other end thereof having a cross-sectional area determined by an internal dimension characteristic of said coil, and a second portion adjacent said first end having a second, smaller cross-sectional area determined jointly by a dimension characteristic of said delay line and by intrinsic properties of the representative materials from which said armature and said delay line are formed; a longitudinal stress wave initiated in the armature in response to an electrical pulse supplied to said coil



by said pulse generator, launching a sonic torsional pulse in the delay line upon arrival at said point thereon, said sonic torsional pulse generating an electrical signal in the delay line upon travelling past said magnet; and the circuit means including timing means responsive respectively to said pulse from the pulse generator and to said electrical signal from the delay line for defining the start and end of a time interval relating to the position of the magnet with respect to said point on the delay line.

4,803,428

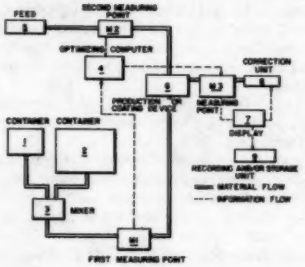
METHOD AND APPARATUS FOR NON-DESTRUCTIVE MATERIAL TESTING, PARTICULARLY FOR DETERMINATION OF THICKNESS OF COATING LAYERS ON A BASE MATERIAL BY MEASURING ELECTRICAL CONDUCTIVITY OR MAGNETIC PERMEABILITY AT THE FINISHED SPECIMEN

Horst-Artur Crostack, Beringweg 2, 5860 Iserlohn, Fed. Rep. of Germany

Filed Jan. 13, 1987, Ser. No. 2,865

Int. Cl.[4] G01B 7/10; G01R 33/12; G01N 27/72

U.S. Cl. 324—230 **13 Claims**



7. An apparatus for non-destructively determining the thickness of pieces and layers of plastic components, as well as bonding and coating layers on a base material having means for determining the electrical conductivity or magnetic permeability of the finished or coated test specimen by using high-fre-

quency electrical or magnetic alternating fields, characterized in that said apparatus comprising in combination:

a first container for supplying said plastic or bonding or coating material;

a second container for supplying electrically conductive or ferromagnetic particles;

a mixer for mixing said particles into said material;

means for processing said material impregnated with said particles for forming a test specimen;

a measuring point (M1) located after the mixer for measuring the electrical conductivity or magnetic permeability of the particle impregnated material prior to being processed by means of broad band test pulses, as far as amplitude and phase spectrum are concerned, generated by said alternating field; and

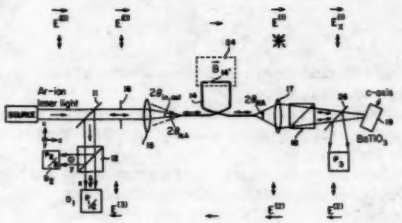
an optimizing unit to which the measuring data output of the measuring point (M1) is fed which generates one or more calibration signals or calibration curves, said signals or curves being fed to the said determining means for the finished or coated test specimen for optimizing the alternating field for the final thickness measurement, wherein said determining means comprises means for setting up the parameters of measuring pulses with predeterminable frequency (amplitude and phase) spectrum generated by the alternating field for the final thickness measurement in accordance with the calibration signal or calibration curves.

4,803,429

RECOVERING POLARIZATION OF LIGHT OF ARBITRARY POLARIZATION PROPAGATING THROUGH DISTORING MEDIUM BY PHASE CONJUGATION REFLECTION BACK THROUGH SAID MEDIUM

Kazuo Kyuma, Nishinomiya, Japan; Sze-Keung Kwong, Long Beach, and Amnon Yariv, San Marino, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Sep. 15, 1986, Ser. No. 907,667
Int. Cl.[4] G01R 33/02
U.S. Cl. 324—244 **9 Claims**



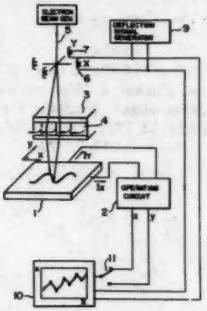
4. Apparatus for achieving true phase conjugation of an incident light wave of arbitrary polarization comprising a polarization and mode scrambling medium and a phase conjugation mirror in sequence, with said medium in front of said mirror for passing incident and reflected light through said medium to and from said mirror whereby a light wave of arbitrary polarization which is first passed through said polarization and mode scrambling medium to said phase conjugate mirror in one direction, and then reflected back as a phase conjugated light wave through said medium in a direction opposite said one direction by said phase conjugate mirror, regains its original polarization state regardless of the wave's transverse components of polarization with respect to the axis of said phase conjugate mirror.

4,803,430

MAGNETIC/ELECTRIC FIELD MEASURING DEVICE BY MEANS OF AN ELECTRON BEAM

Hiroyuki Shinada, Chofu; Hideo Todokoro, Tokyo, and Satoru Fukuhara, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 154,183
Claims priority, application Japan, Feb. 20, 1987, 62-35513
Int. Cl.[4] G01R 33/02, 29/14
U.S. Cl. 324—250 **9 Claims**



1. A magnetic/electric field measuring device comprising:

electron beam generating means for generating an electron beam finely focused;

a sample table, on which a sample is to be placed;

electron beam deflecting means for scanning said electron beam two-dimensionally along an end surface of said sample;

two-dimensional semiconductor position detection element for generating a position signal corresponding to the incident position of said electron beam, which has passed along the end surface of said sample; and

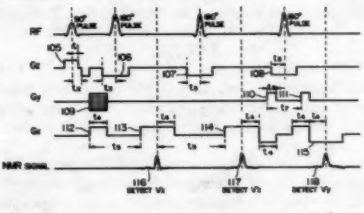
a display section for displaying the position signal coming from said two-dimensional semiconductor position detection element in synchronism with a scan signal for said electron beam.

4,803,431

METHOD FOR IMAGING THREE-DIMENSIONAL MOVING OBJECT

Koichi Sano, Sagamihara; Shinichi Sato, Yokohama; Tetsuo Yokoyama, Tokyo, and Hideaki Koizumi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 21, 1987, Ser. No. 75,947
Claims priority, application Japan, Jul. 25, 1986, 61-173643
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—306 **4 Claims**

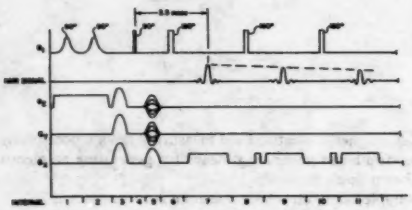


1. A single sequence method for imaging a three-dimensional moving object in an examined object located in a predetermined magnetic field comprising the following steps of:

(a) generating a high frequency pulse train used for exciting hydrogen spin in the examined object;

(b) generating gradient magnetic fields in three orthogonal directions, which are utilized for measuring the speed of the moving object in the examined object;
(c) generating a 180° pulse a plurality of times for obtaining echo signals with respect to nuclear magnetic resonance signal produced by said high frequency pulse train;
(d) measuring variations in the phase in said three orthogonal directions on the basis of multi-echo signals obtained by said 180° pulses; and
(e) obtaining speed components in the phase in said three orthogonal directions of said moving object on the basis of the measured variations in the phase.

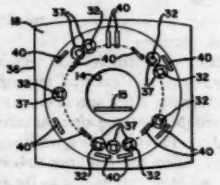
4,803,432
SHORT ECHO NMR IMAGING OF SODIUM
William H. Perman, Fitchburg, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.
Filed Aug. 13, 1987, Ser. No. 85,408
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **6 Claims**



2. A method of producing an NMR signal from paramagnetic nuclei having a short T_2 relaxation constant, the steps comprising:
applying a selective RF saturation pulse in combination with a magnetic field gradient to saturate paramagnetic nuclei on each side of a selected slice of paramagnetic nuclei;
applying a nonselective RF excitation pulse to the paramagnetic nuclei in the selected slice;
applying position encoding magnetic field gradients to the paramagnetic nuclei;
applying a nonselective RF echo pulse to the paramagnetic nuclei in the selected slice;
acquiring an NMR echo signal which is produced by the paramagnetic nuclei in the selected slice; and
in which the RF excitation pulse and the RF echo pulse are each applied to the paramagnetic nuclei as two substantiall orthogonal excitation fields.

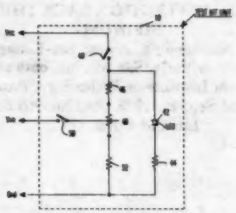
4,803,433
METHOD AND APPARATUS FOR SHIMMING TUBULAR SUPERMAGNETS
John J. McBride, Gibsonia, Pa., assignor to Montefiore Hospital Association of Western Pennsylvania, Inc., Pittsburgh, Pa.
Filed Dec. 21, 1987, Ser. No. 136,201
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **12 Claims**

1. In a magnetic resonance imaging installation including a cylindrical casing containing a tubular supermagnet, improved shimming means for the electromagnetic field of said supermagnet comprising:
plural tubes formed from non-magnetic structural material secured to the said casing with the lengthwise axis of the said tubes being generally parallel to the longitudinal axis of the said tubular supermagnet, each said tube being open at at least one end, plural shim supporting rails, each formed from a nonmagnetic structural material, at least one magnetic material mass secured to each of said shim supporting rails, each said shim supporting rail being adapted to enter one of said plural tubes, the said magnetic material mass on each rail being of appropriate size and weight to function as a magnetic field shim for the said



supermagnet in its existing location, said shim supporting rails being insertable into and removable from the said tubes through said open end.

4,803,434
TEST DEVICE FOR CIRCUIT BREAKERS HAVING ELECTRONIC TRIP UNITS
Christopher G. Walker, Coraopolis, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 18, 1988, Ser. No. 169,929
Int. Cl.[4] G01R *31/02, 31/32*
U.S. Cl. 324—424 **6 Claims**

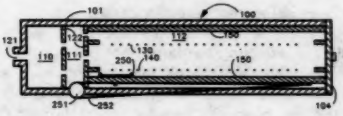


1. An electrical system for power distribution with current conductors, comprising:
a circuit interrupter connected to the current conductors and including an electronic trip unit having solid state components;
a current sensor on at least one of the conductors and having leads extending to the solid state components;
a source of power for the electronic trip unit;
an electronic test unit for monitoring the trip unit characteristics and having first, second, and third circuits;
the first circuit extending from one lead of the current sensor to a ground potential and including a first switch, a light-emitting diode, and a current limiting resistor;
the second circuit extending from one lead of the current sensor to an input test signal conductor and including the first switch, a first resistance, a potentiometer, and a second switch, the first resistance setting the lower limit of adjustability of the potentiometer;
the third circuit extending from the input test signal conductor to the ground potential and including the second switch, the potentiometer, a second resistance, and the second resistance setting the upper limit of adjustability of the potentiometer; whereby the test unit is internally powered by the source of power for the trip unit.

4,803,435
METHOD AND APPARATUS FOR DETECTING DIELECTRIC DEFECTS

Louis T. Mills, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 16, 1986, Ser. No. 920,104
Int. Cl.[4] G01N 27/60
U.S. Cl. 324—456 18 Claims



1. A method for detecting defects in a dielectric material, said method comprising:

bombarding a first side of the dielectric material with gas ions in order to place a uniform charge on the first side of said dielectric material;

exposing a second side of the dielectric material to an electric potential opposite in charge to that of the gas ions;

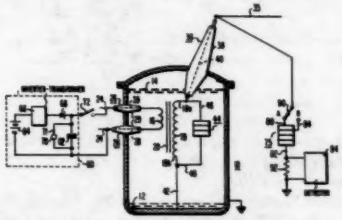
exposing the dielectric material to an indicator substance having an affinity for the charge delivered by the gas ions; and

detecting the presence of defects in the dielectric material by accumulation of the indicator substance.

4,803,436
METHOD AND APPARATUS FOR EVALUATING THE CONDITION OF A GAPLESS METAL-OXIDE VARISTOR LIGHTNING ARRESTER USED FOR PROTECTING A DISTRIBUTION TRANSFORMER

James S. Kresge, Pittsfield, and Gordon E. Zaks, Dalton, both of Mass., assignors to General Electric Company, King of Prussia, Pa.

Filed Sep. 16, 1987, Ser. No. 97,028
Int. Cl.[4] G01R 31/02
U.S. Cl. 324—549 8 Claims



8. Test apparatus for evaluating the condition of a first lightning arrester of the gapless metal-oxide varistor type that is connected across the high voltage winding of a distribution transformer that comprises: (i) a low voltage winding and a high voltage winding inductively coupled together, (ii) a housing in which said windings are located, (iii) a low voltage bushing including a low voltage lead for interconnecting an external low voltage circuit and one terminal of said low voltage winding, and (iv) a high voltage bushing including a high voltage lead for interconnecting an external high voltage circuit and one terminal of said high voltage winding, said test apparatus comprising:

(a) a second lightning arrester of the gapless metal-oxide varistor type having means for changing its breakdown voltage between a first value that is higher than the normal breakdown voltage of the first arrester and a second value that is lower than the normal breakdown voltage of the first arrester,

(b) means for selectively connecting said second arrester across said high voltage winding externally of said transformer housing in each of the following two modes: (i) with its breakdown voltage set at said first value and (ii) with its breakdwon voltage set at said second value,

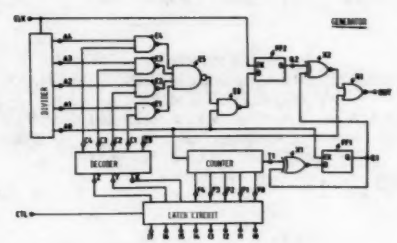
(c) means for applying to said external low voltage circuit at different times first and second electric pulses that are each transformed by said windings to produce at said one terminal of said high voltage winding impulses that are each impressed across the parallel combination of said first and second arresters, the first impulse being impressed when said second arrester is connected as in mode (i) of paragraph (b) and being capable of rising to a voltage at least as high as said first value unless limited by said first arrester, the second impulse being impressed when said second arrester is connected as in mode (ii) of paragraph (b) and being capable of rising to at least said normal breakdown voltage of the first arrester unless limited by one of said arresters,

(d) and means for determining whether said second arrester has conducted significant surge discharge currents in response to impression of each of said first and second impulses across said two arresters.

4,803,437
DIGITAL TRANSMISSION SYSTEM

Peter P. F. Reusens, Destelbergen, Belgium, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Aug. 12, 1987, Ser. No. 84,250
Claims priority, application Belgium, Aug. 12, 1986, 2/61029
Int. Cl.[4] H03K 3/017, 3/02
U.S. Cl. 328—59 15 Claims



1. A signal generator for generating a modulated output signal from a clock signal comprising:

a divider means connected to provide from the clock signal a square wave signal having a first fundamental frequency;

means connected to the divider means to provide from the clock signal a rectangular wave signal having a second fundamental frequency which is an even integral multiple of the first fundamental frequency of said square wave signal; and

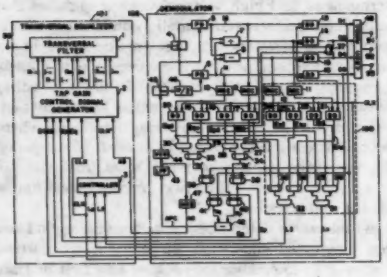
a chopper means connected to chop the square wave signal by the rectangular wave signal as a chopping signal to provide the modulated output signal.

4,803,438

8-PHASE PHASE-SHIFT KEYING DEMODULATOR

Shoichi Mizoguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 8, 1987, Ser. No. 71,108
Claims priority, application Japan, Jul. 9, 1986, 61-161376; Feb. 20, 1987, 62-37632
Int. Cl.[4] H03D 3/18; H03K 9/06
U.S. Cl. 329—50 10 Claims



1. An 8-phase phase-shift keying demodulator comprising:

a transversal equalizer for equalizing an incoming 8-phase phase modulated signal, said transversal equalizer including a transversal filter and a tap gain control signal generator coupled to said transversal filter;

first means coupled to said transversal filter and coherently demodulating the equalized signal;

second means for generating a plurality of error signals

third means for receiving said plurality of error signals and determining whether a signal point of said 8-phase phase modulated signal is usable for controlling said transversal equalizer, said third means producing a first output;

fourth means for detecting asynchronism of said demodulator, said fourth means applying a second output to said tap gain control signal generator; and

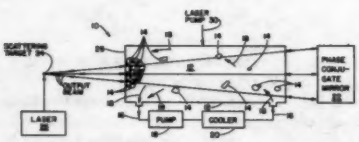
fifth means interposed between said third means and said tap gain control signal generator, receiving said first output and controlling a plurality of selectors forming part of said tap gain control signal generator when said second output indicates asynchronism of the demodulator.

4,803,439

GLASS BEAD LASER AMPLIFIER WITH PHASE CONJUGATE MIRROR

Robert E. Ryan, Levittown, N.Y., assignor to Grumman Aerospace Corportion, Bethpage, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,116
Int. Cl.[4] H01S 3/02
U.S. Cl. 330—4.3 9 Claims



1. A glass laser amplifier, comprising:

a. a laser amplifier cavity having a plurality of adjacent and contiguous doped glass lasing elements therein in contiguous actual contact with and physically touching each other, with the shape of each glass element providing a relatively large ratio of the external area to volume of the glass lasing element, to provide for efficient cooling thereof;

b. a cooling system for said laser amplifier cavity, including a coolant fluid circulating through said laser cavity around and between the contiguous and physically touching glass lasing elements for cooling thereof, said cooling fluid having an index of refraction substantially matching that of the glass lasing elements to substantially reduce scattering of light passing through glass/cooling fluid interfaces in the laser amplifier cavity; and

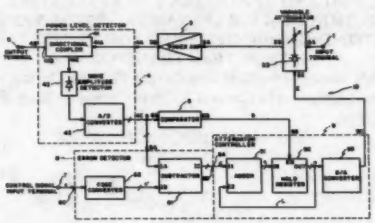
c. a conjugate mirror positioned adjacent said laser amplifier cavity for reflecting the laser light passing through the laser amplifier cavity back through the laser amplifier cavity to cancel the initial optical distortions introduced into the laser beam as it initially passed through the laser amplifier cavity and the glass/cooling fluid interfaces therein, to produce an output laser beam substantially unaffected by the initial optical distortions therein.

4,803,440

AUTOMATIC ELECTRICAL POWER CONTROL CIRCUIT

Toshinori Hotta, and Osamu Yamamoto, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Sep. 16, 1987, Ser. No. 97,845
Claims priority, application Japan, Sep. 25, 1986, 61-227047
Int. Cl.[4] H03G 3/20
U.S. Cl. 330—145 9 Claims



1. An automatic power control circuit comprising:

variable attenuator means disposed ahead of a power amplifier for variably setting the amount of attenuation of an input signal for the power amplifier;

power detection means for detecting a portion of the output from the power amplifier and for generating a power output signal corresponding to the power output level of the power amplifier;

comparison means for comparing the magnitude of the power output signal against a predetermined threshold value and for generating a decision signal based on said comparison indicating the presence or absence of power output from the power amplifier;

error detection means for detecting the difference between control data from an external power output control signal and the power output signal from the detection means and generating an error signal corresponding to said difference;

attenuator control means for integrating the error signal and generating an integrated correction value when the decision signal indicates the presence of power output from the power amplifier, and for generating the most recent prior integrated correction value when the decision signal indicates the absence of power output from the power amplifier; and

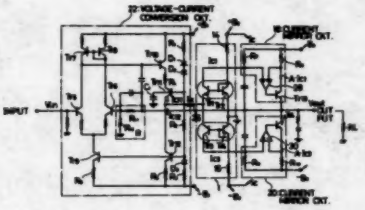
means for transmitting said integrated correction value as a control signal to the variable attenuator.

4,803,441

AMPLIFYING CIRCUIT

Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 10, 1987, Ser. No. 24,028
Claims priority, application Japan, Mar. 14, 1986, 61-56631
Int. Cl.[4] H03F 3/30
U.S. Cl. 330—257 5 Claims



1. An amplifying circuit comprising:

a voltage-current conversion circuit for voltage-current converting an input signal to be amplified;

a current-current conversion circuit comprising a first transistor, a second transistor, a third transistor and a fourth transistor, emitters of said first and third transistors being connected to each other, collector and base of said second transistor being connected to each other, collector and base of said fourth transistor being connected to each other, emitters of said second and fourth transistors being connected to each other, bases of said first and second transistors being connected to each other, bases of said third and fourth transistors being connected to each other, output current of said voltage-current conversion circuit being supplied to the emitters of said first and third transistors and a constant current being supplied to said second and fourth transistors;

an output circuit for synthesizing and outputting collector currents of said first and third transistors after amplifying these collector currents, wherein said output circuit comprises (a) a first current mirror circuit for providing a first output current which is a predetermined multiple of an output current of the first transistor, said first current mirror circuit including first control means having first and second resistors whose resistance ratio determines the predetermined multiple, (b) a second current mirror circuit for providing a second output current which is a predetermined multiple of an output current of the third transistor, said second current mirror circuit including second control means having third and fourth resistors whose resistance ratio determines the predetermined multiple for the second current mirror circuit, and (c) means for combining the first and second output currents to produce a composite output; and

a circuit for negative-feeding back an output of said output circuit to said voltage-current conversion circuit;

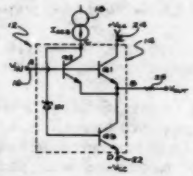
wherein (a) the first current mirror circuit includes a first output transistor, a first differential amplifier driving a base of the first output transistor and having a first input coupled to one terminal of the first resistor and the collector of the first transistor and a second input coupled to one terminal of the second resistor, the other terminals of the resistors being connected to a supply voltage, and (b) the second current mirror circuit comprises a second output transistor, a second differential amplifier driving base of the second output transistor and having a first input coupled to one terminal of the third resistor and the collector of the third transistor and a second input coupled to one terminal of the fourth resistor, the other terminals of the resistors being connected to a supply voltage.

4,803,442

LOW POWER BUFFER AMPLIFIER

Dennis Hogg, Moorpark, Calif., assignor to Micropolis Corporation, Chatsworth, Calif.

Filed Nov. 16, 1987, Ser. No. 120,610
Int. Cl.[4] H03F 3/26
U.S. Cl. 330—274 23 Claims



1. A high efficiency, low crossover distortion, current amplifier circuit comprising:

a first transistor having a base, an emitter and a collector;

a second transistor having a base directly connected to the base of said first transistor, an emitter directly connected to the emitter of said first transistor, and a collector;

means for applying an input signal to the base electrodes of said first and second transistors;

a third transistor having a base, an emitter, and a collector which is directly connected to the emitters of said first and second transistors;

said first, second and third transistors all being of the same polarity type;

constant current source means for supplying current to the collector of said second transistor, and to the base of said third transistor;

DC biasing means for applying a potential to the collector of said first transistor;

DC biasing means for applying a potential to the emitter of said third transistor; and

voltage-level shifting means for biasing said third transistor off when said second transistor is substantially conducting and consumes all of the current from the constant current source, and for biasing said third transistor on when said second transistor is not fully conducting and does not consume all of the current from the constant current source;

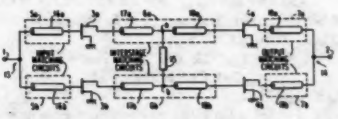
whereby said first and second transistors are in full amplification mode during one polarity swing of the input signal, and said third transistor is in full amplification mode during the opposite polarity swing of the input signal, resulting in a low power consumption as well as low crossover distortion.

4,803,443

MICROWAVE POWER COMBINING FET AMPLIFIER

Tadashi Takagi; Kiyoharu Seino, and Fumio Takeda, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1988, Ser. No. 177,738
Claims priority, application Japan, Apr. 10, 1987, 62-87954
Int. Cl.[4] H03F 3/68
U.S. Cl. 330—277 6 Claims



1. A microwave power combining FET amplifier, comprising:

(a) an input T-type branch circuit (13) for splitting a microwave input signal into two components,

(b) a pair of multistage FET amplifiers connected in parallel, each of said amplifiers being formed by a microwave integrated circuit and comprising, in series, an input matching circuit (5*a*, 5*b*) connected to said branch circuit and receiving one of said split signal components, a prestage FET (3*a*, 3*b*), an interstage matching circuit (6*a*, 6*b*), a post-stage FET (4*a*, 4*b*), and an output matching circuit (7*a*, 7*b*),

(c) an output T-type branch circuit (14) connected to said output matching circuits for combining said split signal components, and

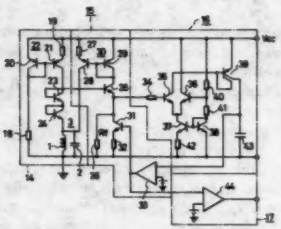
(d) a resistance circuit (15) having a predetermined resistance value connected between predetermined, opposite positions (a, b) of said interstage matching circuits for absorbing odd propagation mode microwaves reflected back from the output branch circuit due to non-uniformities between the characteristics of said amplifiers.

4,803,444

PROXIMITY SWITCH

Fumito Takahashi, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 2, 1987, Ser. No. 127,403
Claims priority, application Japan, Jan. 14, 1987, 62-6732
Int. Cl.[4] H03B *5/12*
U.S. Cl. 331—65 **6 Claims**



1. A proximity switch comprising:

high-frequency oscillation means including a detection coil for generating an output voltage signal when an object approaches said detection coil;

rectification means for rectifying and smoothing said output voltage signal from said high-frequency oscillation means into a feedback signal;

feedback means for feeding back said feedback signal from said rectification means to said high-frequency oscillation means to maintain said output voltage signal substantially constant; and

output means for generating a detection signal when the quantity of feedback by said feedback means exceeds a predetermined value, said detection signal generated by said output means indicating detection of said approaching object.

4,803,445

VARIABLE FREQUENCY OSCILLATOR

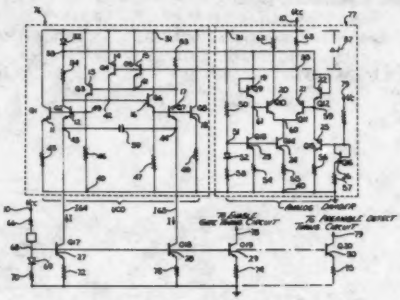
Richard G. Yamasaki, Torrance, Calif., assignor to Silicon Systems, Inc., Tustin, Calif.

Filed Apr. 22, 1987, Ser. No. 41,767
Int. Cl.[4] H03K *3/281*
U.S. Cl. 331—177 R **9 Claims**

1. A circuit for providing a variable frequency oscillator (VFO) comprising:

oscillating means having a center frequency and outputting a first clock signal;

first control means coupled to a control voltage and said oscillating means for controlling said first clock signal;



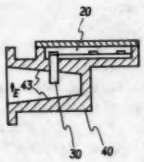
second control means coupled to said oscillating means for controlling said center frequency and outputting a plurality of second clock signals, said second control means independent of said first control means.

4,803,446

LOW NOISE MICROWAVE AMPLIFIER

Hiroshi Watanabe, Gyoda, and Masanobu Suzuki, Nagareyama, both of Japan, assignors to New Japan Radio Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 843,948, Mar. 26, 1986, abandoned. This application Aug. 7, 1987, Ser. No. 82,695
Claims priority, application Japan, Mar. 28, 1985, 60-64795
Int. Cl.[4] H03H *5/00*
U.S. Cl. 333—26 **3 Claims**



1. A 4 GHz-band low noise microwave amplifier comprising:

a converter for converting a microwave input from a waveguide into a coaxial stripline; and

an amplifier portion for amplifying an output from the converter,

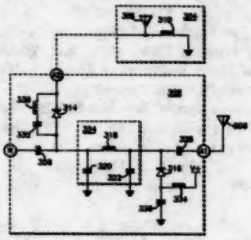
wherein the converter comprises a waveguide having a pair of wider walls and a pair of narrower walls, and a probe provided within a cavity of the waveguide defined by said walls, a distance between a pair of narrower walls is narrowed near a portion where the probe is provided so that the cutoff frequency comes from 80% to 90% of a lower limit frequency of a desirable amplifying bandwidth, and the amplifier portion is connected to the probe of the converter, and comprises a microstrip line formed on a substrate made of dielectric and an amplifying element.

4,803,447

THREE TERMINAL REMOTELY CONTROLLED SPDT ANTENNA SWITCH

Charles A. Schultz, Sunrise; Paul D. Marko, Pembroke Pines, and Giovanni Jaramillo, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 29, 1988, Ser. No. 161,502
Int. Cl.[4] H03H 11/36; H01P 1/15
U.S. Cl. 333—103 6 Claims



4. A remote antenna switching system, comprising in combination:

a remote antenna system including a remote antenna and a low pass filter coupled to said remote antenna; and

a three terminal antenna switch including a radio terminal, first and second antenna terminals, said first antenna terminal being suitable for connection to a local antenna, first coupling means for coupling radio frequency signals between said radio terminal and said first antenna terminal when said second antenna terminal is unterminated, and second coupling means for coupling the radio frequency signals between said radio terminal and said second antenna terminal and for impeding the flow of the radio frequency signals between said radio terminal and said first antenna terminal when said second antenna terminal is coupled to said remote antenna;

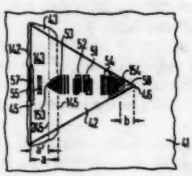
such that DC current flow between said remote antenna system and said antenna switch when said second antenna terminal is coupled to said remote antenna, and said DC current causes said second coupling means to be activated.

4,803,448

CANTILEVER MOUNT OF A SUBSTRATE LAMINA OF A SURFACE WAVE DEVICE

Peter Zibis, and Wolfgang Pahl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 937,416, Dec. 3, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 133,235
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543079; Feb. 26, 1986, 3606214
Int. Cl.[4] H03H 9/145, 9/25, 9/64
U.S. Cl. 333—151 20 Claims



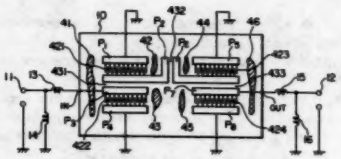
1. A mounting means for a substrate lamina of a surface wave component, said substrate lamina includes a transducer structure and at least one reflector structure and is mounted on a foundation, means for joining said substrate lamina and said foundation, whereby at least one of the reflector structures mounted on the substrate being a defining structure defining prescribed properties of the component comprising, said substrate lamina (42) has a tapered shape so that the substrate lamina has a broad, first end (45) and an opposite, second end (46) which is narrower than said first end, said joining means (43) located only in the region (143) of said first end (45) of said substrate lamina (42) and said joining means extending maximally only up to about the middle position (145) of this defining reflector structure (53) which is positioned closest to said first end on said substrate surface; said second end (46) being free-floating relative to said foundation, so that mechanical distortions of the material of said substrate lamina (42) which could act on the substrate lamina in the region of said transducer and reflector structure mounted on said substrate surface are minimized.

4,803,449

FILTER COMBINING SURFACE ACOUSTIC WAVE RESONATORS

Mitsutaka Hikita, Hachiouji; Yoichi Saigo, Kanagawa, and Kazuhito Kurosawa, Nakaminato, all of Japan, assignors to Hitachi Video Engineering, Inc., Tokyo, Japan and Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 122,325
Claims priority, application Japan, Nov. 25, 1986, 61-278642
Int. Cl.[4] H03H 9/64, 9/25
U.S. Cl. 333—193 18 Claims



1. A filter combining surface acoustic wave resonators comprising:

a piezoelectric substrate;

a plurality of resonators disposed on said piezoelectric substrate so as to comprise a series circuit formed by connecting in series a plurality of circuit elements each including a capacitance element having a corresponding pair of electrodes, and wherein individual resonators in the form of one-port surface acoustic wave resonators are respectively coupled between an electrode of each said circuit element and a common ground;

a first external matching circuit inserted between a signal input terminal and said resonator; and

a second external matching circuit inserted between a signal output terminal and said resonator.

4,803,450

MULTILAYER CIRCUIT BOARD FABRICATED FROM SILICON

James F. Burgess, Schenectady; Homer H. Glascock, II; Harold F. Webster, both of Scotia; Constantine A. Neugebauer, Schenectady, and James A. Loughran, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 14, 1987, Ser. No. 134,268
Int. Cl.[4] H01P 3/08; H05K 3/36; B32B 9/06; B23K 31/02
U.S. Cl. 333—238 19 Claims

1. A multilayer silicon circuit board structure, comprising:

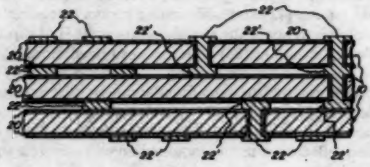
a plurality of silicon substrates, each of said silicon substrates having a first conductive pattern formed on a top surface and a second conductive pattern formed on a bottom surface of said substrate, each of said conductive patterns-

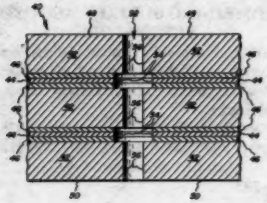
comprising a high melting point holder on a wettable conductor;

conductive vias formed in each of said silicon substrates so as to electrically connect, in said each of said silicon substrates, said first conductive pattern with said second conductive pattern, said first and second conductive patterns on adjacent silicon substrates, respectively, being mirror images of each other;

said plurality of silicon substrates being arranged in a stack; and

said high melting point solder of said first and second conductive patterns on adjacent silicon substrates, respectively, being merged with one another to form a bond.





4,803,451
TECHNIQUE FOR CALIBRATING AN ELECTROMAGNETIC RELAY

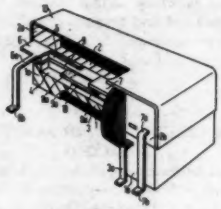
Klaus Luesebürger, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 28, 1987, Ser. No. 55,563

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1986, 3620941

Int. Cl.[4] H01F 7/13

U.S. Cl. 335—273 15 Claims



1. A method for calibrating the switching characteristics of an electromagnetic relay including at least one flat pole plate and an armature being resiliently mounted, and opposing the pole plate with overlapping pole faces while leaving a prescribed air gap are accommodated in a housing, the method comprising the steps of initially securing at least one element of a group including the at least one pole plate and the armature in the housing, positioning at least one unsecured element in a guide slot in the housing while maintaining a prescribed air gap in a manner wherein it can slide back and forth parallel with the pole faces; varying the overlap of the pole faces by incrementally displacing the sliding element while measuring the different characteristics relating to the relay's response and drop; and securing the sliding element in a fixed position in the housing when the characteristics are within a prescribed range.

4,803,452
SUPERCONDUCTOR FOR MAGNETIC FIELD SHIELDING

Yoshiro Saji, 7-6 Satakedai 5-chome, Suita-shi, Osaka; Eichi Tada, Kobe; Hiroaki Toda, Shiki, and Yoshiaki Kawahara, Himeji, all of Japan, assignors to Yoshiro Saji and Kootsu Gas Co., Ltd., both of Osaka, Japan

Continuation-in-part of Ser. No. 826,291, Feb. 5, 1986, abandoned. This application Dec. 29, 1987, Ser. No. 139,604

Claims priority, application Japan, Feb. 8, 1985, 60-24254

Int. Cl.[4] H01F 7/00

U.S. Cl. 335—301 13 Claims

1. A magnetic field shield including a superconductor film having a magnetic field shielding effect which abruptly increases from the vicinity of the origin to a turning point of a graph illustrating the relationship between the thickness of a single layer of said superconductor film and the magnetic field shielding effect of said superconductor film, and after said turning point gradually increases as the thickness of said superconductor film increases, said magnetic field shield being characterized in that it comprises at least one composite lamination comprising a thin film of said superconductor, said thin film having a thickness not more than that obtained at said turning point and not less than 0.05 μm but not more than 2.0 μm.

4,803,453
LAMINATED TRANSFORMER

Kunisaburo Tomono; Harufumi Mandai; Toshio Kawabata; Yukio Sakamoto; Teyoaki Tsunematsu, and Toshimi Kaneko, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Sep. 15, 1987, Ser. No. 96,407

Claims priority, application Japan, Sep. 22, 1986, 61-224650

Int. Cl.[4] H01F 27/30

U.S. Cl. 336—183 4 Claims

1. A laminated transformer comprising:

a laminated sintered body comprising a plurality of ferrite sheets,

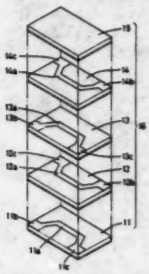
each of said ferrite sheets having end faces, and a conductor pattern thereon having each end extending to different portions of said end faces,

the conductor patterns of some of said plurality of ferrite sheets serving as the primary of the transformer and the conductor patterns of the remainder of said plurality of ferrite sheets serving as the secondary of the transformer; and

a pair of primary electrodes connecting the conductor patterns serving as the primary of the transformer in parallel, and a pair of secondary electrodes connecting the conductor patterns serving as the secondary of the transformer in parallel,

said pair of primary electrodes electrically connected to ends of only the conductor patterns serving as the primary

of the transformer at first and second locations from and to which the conductor patterns serving as the primary of the transformer extend, respectively, and



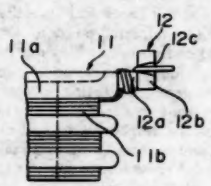
said pair of secondary electrodes electrically connected to ends of only the conductor patterns serving as the secondary of the transformer at third and fourth locations from and to which the conductor patterns serving as the secondary of the transformer extend, respectively.

4,803,454

IGNITION COIL

Tomokazu Umezaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,637
Claims priority, application Japan, May 13, 1987, 62-117421
Int. Cl.[4] H01F *15/10*
U.S. Cl. 336—192 **1 Claim**



1. An ignition coil having a secondary winding wound on and around a secondary bobbin, having one end of the secondary winding connected to a high voltage terminal, and having a portion of the secondary winding close to the connected end engaged with a binding portion formed on a circumferential edge of one end of the secondary bobbin, wherein the binding portion comprises a winding piece which projects outwardly in the radial direction of the secondary bobbin and around which an end portion of the secondary winding is wound in several turns, and an engaging piece which is formed to extend from the leading edge of the winding piece along the central axis the secondary bobbin and which has a side surface formed with a groove for inserting the secondary winding for clipping.

4,803,455

AUTOMATIC AND MANUALLY RESETTABLE MINIATURIZED CIRCUIT BREAKER

Robert A. Kaczynski, 520 Springfield Ave., Westfield, N.J. 07090

Filed Dec. 28, 1987, Ser. No. 138,562
Int. Cl.[4] H01H *71/16*
U.S. Cl. 337—68 **19 Claims**

1. A miniature circuit breaker comprising,

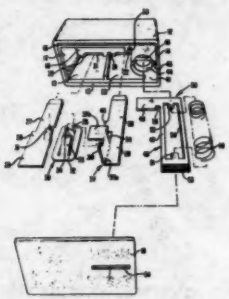
a. sized housing means having, wall means including, a back wall, a front wall, spaced side walls therebetween, and an end wall defining an element chamber,

b. spaced mounting guides on the element chamber surface of the back wall disposed parallel to the longitudinal line of the housing,

c. spaced slot means in the end wall respectively disposed in alignment with an associated one of said spaced mounting guides,

d. first elongated current carrying means disposed in one of said spaced mounting guides and having a portion thereof extending through one of the aligned slot means to form a first terminal means,

e. second elongated current carrying means disposed in another of said spaced mounting guides also having a portion thereof extending through another of said aligned slot means to form a second terminal means aligned with and parallel to said first terminal means,



f. first contact means in said element chamber fixedly connected to said first elongated current carrying means,

g. bimetallic actuating means in said element chamber connected to said second elongated current carrying means having, a bimetallic element disposed in alignment with the second elongated current carrying means,

h. second contact means on said bimetallic element movable for engagement and disengagement with the first contact means as a function of the operation of said bimetallic element, and

i. said first elongated current carrying means, said second elongated current carrying means, and said bimetallic actuator so mounted, assembled and nested in the housing that the bimetallic element is free for substantial amplitude of movement to permit operation of the circuit breaker in the cycling mode.

4,803,456

SUPERCONDUCTIVE SWITCH

Jay F. Benesch, Schenectady, N.Y., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 22, 1987, Ser. No. 136,890
Int. Cl.[4] H01L *43/00*
U.S. Cl. 338—32 S **11 Claims**

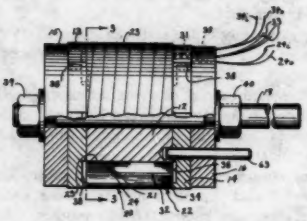
1. A superconducting switch, comprising:

a housing;

at least two lengths of superconductor in said housing, each said length being electrically insulated from the other length and having ends which extend outside of the housing for connection to a superconducting circuit; and

a heater element in said housing, said heater element being in

thermal communication with each length of superconductor;



wherein the heater element controls whether both lengths of superconductor are persistent or non-persistent and does so substantially simultaneously.

4,803,457

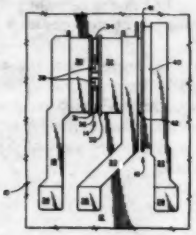
COMPOUND RESISTOR AND MANUFACTURING METHOD THEREFORE

Roy W. Chapel, Jr., 23417 93rd Ave. W., Edmonds, Wash. 98020; David N. Duperon, 9911 84th St. NE., Lake Stevens, Wash. 98258, and Joseph E. Meadows, 4841 268th Ave. NE., Redmond, Wash. 98053

Filed Feb. 27, 1987, Ser. No. 19,669

Int. Cl.[4] H01C *10/00*

U.S. Cl. 338—195 **13 Claims**



1. A compound resistor comprising:

a first portion having a first resistance and a first temperature coefficient of resistance; and

a second portion connected to said first portion having a second resistance and a second temperature coefficient of resistance, said first resistance different in magnitude from said second resistance and said second temperature coefficient of resistance different in magnitude from and opposite in direction from said first temperature coefficient of resistance, at least one of said first and second portions configured to have a temperature coefficient of resistance which substantially cancels out the temperature coefficient of resistance of the other said first and second portions to provide a substantially zero composite temperature coefficient of resistance for said compound resistor.

4,803,458

CONTROL SWITCH AND POTENTIOMETER FOR HEARING AIDS AND THE LIKE

John A. Trine, Lake Elmo; David A. Samdahl, White Oak, and Daryle L. Petersen, Eagan, all of Minn., assignors to Wilbrecht Electronics, Inc., St. Paul, Minn.

Filed Aug. 28, 1987, Ser. No. 90,687

Int. Cl.[4] H01C *10/50*

U.S. Cl. 338—198 **24 Claims**

1. A switch and potentiometer assembly for use in electrical connection with a hearing aid having a microphone, an amplifier, and a speaker to be inserted within an ear canal of a user, said switch and potentiometer assembly comprising:

a housing;

a driver shaft extending within said housing and mounted for rotational motion around an axis of rotation and reciprocal motion generally parallel with said axis of rotation;

a knob member connected to and carried on said driver shaft, said knob member being positioned such that said knob member may be gripped by the user while inserting or removing the hearing aid from the ear canal, said knob member and said driver shaft further being movable between a retracted position proximate to said housing and an extended position displaced outwardly from said housing and from said retracted position;

normally closed switch means movable between a closed position completing a first electrical circuit and an open position interrupting said first electrical circuit, said switch means being movable from said closed position to said open position responsive to said driver shaft being moved from said retracted position to said extended position; and variable resistance means for varying a resistance of a second electrical circuit, said variable resistance means varying said resistance of said second electrical circuit in response to rotation of said driver shaft around said axis of rotation, whereby the hearing aid may be moved against a resistive force by the user pulling on or pushing against the knob member such that the first electrical circuit is disconnected and the hearing aid is turned off when the hearing aid is moved against the resistive force by the user pulling on the knob member and moving the driver shaft to the retracted position, and the first electronic circuit is completed and the hearing aid turned on when the hearing aid is moved against the resistive force by the user pushing on the knob member and moving the driver shaft to the retracted position.

4,803,459

ELECTRONIC MULTI-PURPOSE WARNING DEVICE FOR MOTOR VEHICLES AND MOTOR BOATS

S. Henry Ta, 6240 E. Tamgrind, Agoura, Calif. 91301

Filed Apr. 14, 1987, Ser. No. 38,002

Int. Cl.[4] B60Q *1/00*; G08B *21/00*

U.S. Cl. 340—52 R **18 Claims**

1. A method for monitoring and indicating the conditions of a plurality of electrical functions and compnen in a motor vehicle or motorboat, comprising the steps of:

(a) automatically sensing the discharge current of a storage battery used in a motor vehicle or motorboat by means of

sensing an equivalent voltage drop signal caused by said discharge current;

(b) automatically comparing said voltage drop signals to a preset value of an adjustable reference voltage by means of a voltage comparator;

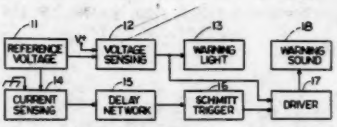
(c) automatically indicating the result of the comparison with a first indicator means to provide an audio warning indication when said voltage drop signal exceeds the preset value of said adjustable reference voltage;

(d) determining a low-charge battery voltage hereinafter referred to as a cut-off voltage at which the vehicle starting motor can only be cranked very slowly but still be able to start the engine;

(e) deriving from the voltage between the positive and negative battery cables or clamps by which the battery terminals are connected to the load a fixed reference voltage which remains constant independently of the battery load conditions and is at a lesser voltage than said cut-off voltage, said voltage between the battery cables or clamps being referred hereinafter as supply voltage;

(f) deriving from said supply voltage a first voltage which varies proportionally with the battery voltage under different load conditions;

(g) storing the value of said first voltage to a first copacitor to discharge from its initially stored value down to an actual value of said first voltage during engine start-up is



BLOCK DIAGRAM OF 9

equal to the time for the battery current to stabilize after initial loading of said battery by a starting motor;

(h) applying said fixed reference voltage to an inverting input of a latching/voltage comparator and said first voltage to a noninverting input of said latching voltage comparator, and adjusting said first voltage to such a value that at battery voltage equal to/or less than said cut-off voltage, the output terminal of said latching voltage comparator is driven toward ground level;

(i) automatically indicating the comparison result from said latching voltage comparator with said first indicator means and with a light emitting diode as a second indicator means to provide a combined audio-visual warning indication when the output of said latching voltage comparator is driven toward ground level;

(j) connecting the electrodes of said light emitting diode to the inverting input and the output terminal of said latching voltage comparator such that when said output terminal is driven toward ground level, said light emitting diode conducts and latches said output terminal to ground whereby said first indicator means and said light emitting diode as a second visual indicator means are also latched to their "on" state until the applying power is removed;

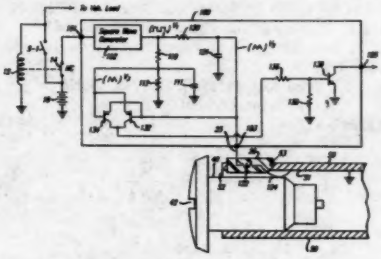
(k) protecting said voltage comparator, said latching voltage comparator, and said indicator means against a connection to the battery cables or battery cable clamps when in wrong polarity.

4,803,460

ANTI-THEFT SYSTEM

Dennis W. Rhee, Bloomfield Hills, and Sidney R. Fletcher, Franklin, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 18, 1987, Ser. No. 50,814
Int. Cl.[4] B60R *25/00*
U.S. Cl. 340—63 **3 Claims**



1. An anti-theft lock assembly comprising:

a lock housing having an electrically grounded inner surface and first open end for receiving a lock assembly;

switch means mounted in said housing for closing an electrical path when said lock assembly is received in said housing and for opening an electrical path when said lock assembly is removed from said housing including a resilient spring contact member that is compressed against said grounded inner surface when said lock assembly is received in said housing and a resistor having a predetermined value of resistance in series with said resilient spring contact member; and

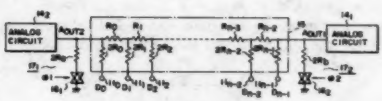
electrical means connected to said switch means providing a signal to said resistor for sensing any change in the electrical resistance to ground of said switch means and for outputting an alarm signal when the electrical resistance of said switch means exceeds the predetermined value.

4,803,461

R-2R TYPE D/A CONVERTER CIRCUIT

Akira Yamaguchi, Yokohama, and Toshimasa Kawasi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 16, 1987, Ser. No. 97,105
Claims priority, application Japan, Sep. 16, 1986, 61-217515
Int. Cl.[4] H03M *1/12*
U.S. Cl. 341—154 **4 Claims**



1. An R-2R type D/A converter circuit comprising:

an R-2R type ladder resistor circuit which receives a digital signal, said R-2R type ladder resistor circuit having two output terminals located at two corresponding respective sides of the R-2R ladder type resistor circuit;

a first series circuit, connected between one output terminal of said ladder resistor circuit and the ground, and provided with a first resistor and a first switch which are series-connected;

a second series circuit, connected between the other output terminal of said ladder resistor circuit and the ground, and provided with a second resistor and a second switch which are series-connected; and

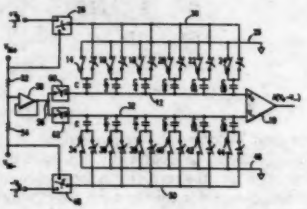
signal means for selectively turning on a selected one of said first and second switches, and for obtaining an analog signal from one of said two output terminals of said ladder resistor circuit, located on the side of said ladder resistor circuit corresponding to the other one of said first and second switches which is turned off.

4,803,462

CHARGE REDISTRIBUTION A/D CONVERTER WITH INCREASED COMMON MODE REJECTION

Richard K. Hester, Whitewright, and Michiel de Wit, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 11, 1987, Ser. No. 84,276
Int. Cl.[4] H03M 1/38
U.S. Cl. 341—172 **24 Claims**



1. A differential analog-to-digital converter, comprising:

differential amplifier means for receiving a differential input voltage and outputting a signal proportional thereto;

a positive capacitor array of binary weighted capacitors having a common top plate connected to the positive differential input of said amplifier means;

a negative capacitor array of binary weighted capacitors having a common top plate connected to the negative differential input of said amplifier means;

sample means for sampling an analog differential input voltage onto the capacitors in said positive and negative arrays such that the top plates in said positive and negative capacitor arrays have a differential voltage impressed therebetween that is proportional to the analog differential input voltage;

shift means for shifting the common mode voltage on the top plates of the positive and negative capacitor arrays to a predetermined common mode input voltage for input to said amplifier means; and

redistribution means for redistributing the charge in the capacitors in said positive and negative arrays to provide a zero differential voltage on the input of said amplifier means in accordance with a successive approximation technique that is responsive to the output signal of said amplifier means to determine the digital value corresponding to the voltage level of the analog differential input voltage.

4,803,463

KEY INPUT MEANS WITH CHANGEABLE DISPLAY MEANS FOR DISPLAYING KEY FUNCTIONS

Ichiro Sado, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

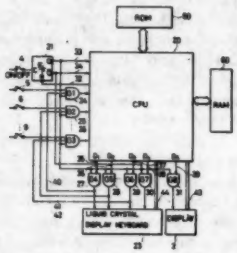
Continuation of Ser. No. 532,145, Sep. 14, 1983, abandoned. This application Dec. 17, 1986, Ser. No. 942,920
Claims priority, application Japan, Sep. 21, 1982, 57-163096
Int. Cl.[4] G06F 3/02
U.S. Cl. 341—23 **5 Claims**

1. An electronic apparatus comprising:

a plurality of first key means for designating power ON of a power source;

a plurality of second key means for inputting data;

display means responsive to the operation of said first key means for displaying a definition of each key of said first key means and said second key means on each key of said first and second key means; and



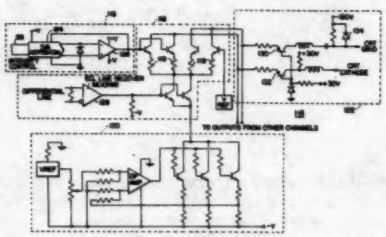
control means for controlling said display means to display on one of said first key means that said one is a key for designating power OFF of the power source.

4,803,464

ANALOG DISPLAY CIRCUIT INCLUDING A WIDEBAND AMPLIFIER CIRCUIT FOR A HIGH RESOLUTION RASTER DISPLAY SYSTEM

Richard E. Holmes, Bellbrook, and Joe A. Mays, Xenia, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 600,890, Apr. 16, 1984, abandoned. This application Feb. 9, 1988, Ser. No. 150,486
Int. Cl.[4] G09G 1/28
U.S. Cl. 340—732 **1 Claim**



1. A high speed analog display circuit, coupled to receive a signal for each pixel of an image to be displayed, for driving a cathode ray tube in a raster display system, comprising:

a first multichannel amplifier, a second multichannel amplifier and a third multichannel amplifier, each of said first, second and third multichannel amplifiers comprising: a plurality of independent signal channels, each of said independent signal channels, comprising:

a digital to analog converter for receiving a low speed intensity control signal, said digital to analog converter producing an analog intensity signal in response to said low speed intensity control signal;

a differential amplifier current switching circuit having a differential amplifier coupled to said digital to analog converter to receive said analog intensity signal therefrom and to produce an output current signal in response to said analog intensity signal;

a differential line pair for receiving a high speed digital attribute data signal;

a switch coupled to said differential line pair and to said differential amplifier enabling or disabling said differential amplifier in response to the presence or absence of the

high speed digital attribute data signal on said differential line pair;

means for coupling said output current signals of each of said differential amplifiers in parallel, said coupling means receiving one of said output current signals at a time; and

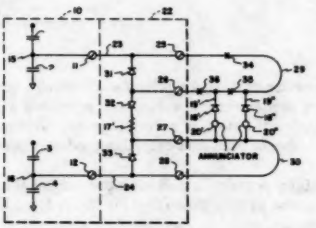
a current to voltage converter coupled to said coupling means to receive said selected output current signals and to produce an analog voltage chroma signal for driving a cathode ray tube in response thereto.

4,803,465

APPARATUS FOR IMPROVING THE RELIABILITY OF AN ALARM CIRCUIT

Daniel G. Prysby, Elk Grove Village, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 1, 1986, Ser. No. 880,626
Int. Cl.[4] G08B *29/00*
U.S. Cl. 340—507 **8 Claims**



1. A module for a central control panel having first and second terminal means for providing output signals to a class B alarm circuit to allow said central control panel to be connected to a class A alarm circuit, said module comprising:

support means for holding electrical components;

first and second terminal means for electrically connecting to said central control panel, said module first and second terminal means being physically attached to said support means;

third, fourth, fifth and sixth terminal means for electrically connecting a class A alarm circuit, said third terminal means being directly electrically connected to said module first terminal means, and said sixth terminal means being directly electrically connected to said module second terminal means, said third, fourth, fifth and sixth terminal means being physically attached to said support means;

first connecting means for electrically connecting said fourth terminal means to said fifth terminal means, said first connecting means being physically attached to said support means;

said third and fourth terminal means being connectable to a first loop of a pair of loops of a class A alarm circuit; and

said fifth and sixth terminal means being connectable to a second loop of said pair of loops.

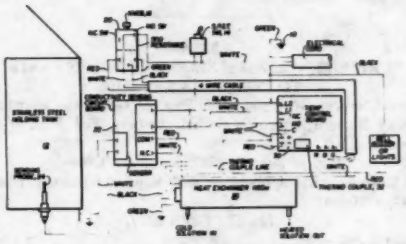
4,803,466

CLEANING MACHINE FOR CARPET, UPHOLSTERY AND DRAPERIES

Bernard Gurstein, Canoga Park, and Russell S. Gurstein, Agoura Hills, both of Calif., assignors to U.S. Products, Inc., Agoura Hills, Calif.

Filed Sep. 11, 1987, Ser. No. 95,302
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—603 **8 Claims**

1. A cleaning machine comprising, in combination, a liquid holding means; sensing means within said holding means for determining whether a liquid in said holding means is aqueous or non-aqueous, said sensor providing input to a signal providing means for providing one signal when said liquid is aqueous and a different signal when said liquid is non-aqueous; heating means in fluid communication with said holding means; means for limiting the maximum temperature to which said heating means can raise said liquid, said limiting means receiving input



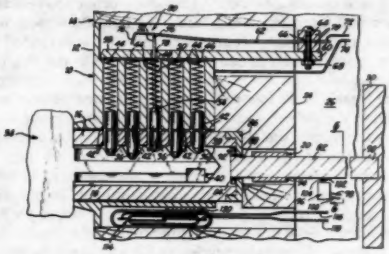
from said signal providing means and being in electrical communication with said heating means, said maximum temperature significantly varying according to said signal received from said signal providing means.

4,803,467

MAGNETIC KEY LOCK PROVIDED WITH AN ALARM SYSTEM

George Peters, 201 Ryder Ave., Brooklyn, N.Y. 11230

Filed Feb. 23, 1988, Ser. No. 159,209
Int. Cl.[4] E05B *45/06*; H01H *27/06*
U.S. Cl. 340—542 **20 Claims**



1. A magnetic key lock being opened and locked by a proper associated magnet-bearing key, said key lock comprising:

a key slot for receiving the proper associated magnet-bearing key therein to open and lock said key lock;

an alarm system including electrical means to activate said alarm system when an improper key, lock pick and the like is inserted into said key slot;

first and second switches electrically connected to said electrical means of said alarm system, said first switch being normally closed when said key lock is locked, and said first switch being open when said key lock is open, said second switch being normally open when nothing is inserted in said key slot;

said electrical means activating said alarm system when said first and second switches are both closed, said second switch being closed when a key, lock pick and the like is inserted into said key slot, said alarm system normally being inactivated when said first switch is open; and

magnetic sensor means electrically connected to said electrical means of said alarm system to delay activating effect of said second switch on said electrical means when said second switch is closed by the insertion of the proper magnet-bearing key in said key slot;

said magnetic sensor means being disposed adjacent to said

key slot to be activated by the proper magnet-bearing key when inserted into said key slot;

said delay being for a selected time period in order to allow the proper magnet-bearing key to open said key lock and, at the same time, open said first switch to inactivate said alarm system.

4,803,468

SECURITY FENCE WITH SECURITY WIRES FASTENED TO POSTS VIA SENSORS

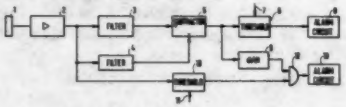
Harald Seifert, Hofheim, Fed. Rep. of Germany, assignor to KTV Sicherheitstechnik GmbH, Amberg, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 71,808

Claims priority, application Fed. Rep. of Germany, May 8, 1987, 87106681

Int. Cl.[4] G08B *13/12*

U.S. Cl. 340—566 **5 Claims**



1. A security fence comprising wires fastened to posts via sensors, at least one electronic evaluation circuit connected to the sensors for releasing an alarm signal when one of the sensors signals a contact to the wire connected to it, each evaluation circuit being comprised of first and second low pass filters to which each sensor is connected, each filter having different cutoff frequencies, one cutoff frequency being above and the other cutoff frequency being below the frequency spectrum of a sensor signal which occurs when the wire is deflected by a person, a subtraction circuit being connected to the outputs of the low pass filters for providing the difference between the output signals of the low pass filters, a first threshold circuit for receiving the output signals of the subtraction circuit for applying the output signals above a predetermined amplitude to a first alarm circuit, a second threshold circuit for receiving signals from the sensors connected to the low pass filters and for passing sensor signals above a predetermined amplitude, an AND gate for receiving the sensor signals above a predetermined amplitude at one input, a differentiator for receiving the output signal of the subtraction circuit and for providing an output signal comprised of the time differential of the output signal of the subtraction circuit to a second input of the AND gate, and a second alarm circuit connected to the output of the AND gate and being enabled when a signal appears at both inputs of the AND gate.

4,803,469

FIRE ALARM SYSTEM

Eiji Matsushita, Yamato, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Jul. 14, 1986, Ser. No. 884,976

Claims priority, application Japan, Jul. 18, 1985, 60-158569

Int. Cl.[4] G08B *17/06*

U.S. Cl. 340—577 **18 Claims**

1. A fire alarm system which comprises:

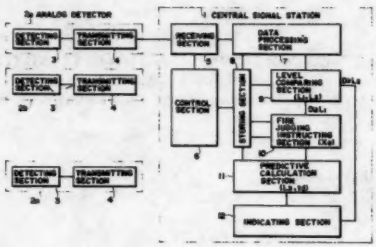
one or more detecting sections for detecting a change in the surrounding phenomena due to a fire and outputting data in an analog mode;

a data processing section receiving said outputted analog data from the detecting section or sections at intervals and smoothing said analog data by interrelating analog data from a plurality of said intervals;

a storing section for storing the smoothed data output from the data processing section;

a level comparing section for comparing a data level represented by present smoothed data output from the detecting section or sections with a preset level and producing a comparison signal when such level is exceeded;

a fire judging instructing section which extracts a plurality of data stored during a predetermined period of time preceding the time when a comparison signal is obtained from the level comparing section, calculates a change amount between the respective extracted data, determines



the number of data for which such change amounts exceed a predetermined value, and generates a signal for instructing the start of a fire judgment calculation when the number of such data exceeds a predetermined number; and

a fire judging section for making a fire judgment calculation in response to the signal from the fire judging instructing section.

4,803,470

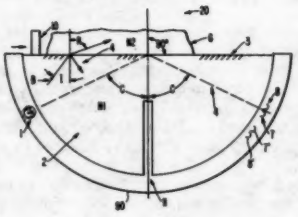
SUBSTANCE DETECTOR DEVICE

Howard Fineman, 13305 Lockgate Pl., Herndon, Va. 22071

Filed Apr. 23, 1986, Ser. No. 854,801

Int. Cl.[4] G08B *19/02*

U.S. Cl. 340—583 **18 Claims**



1. A substance detection device comprising:

an optically transparent element having a polished surface;

a first light source for transmitting light through said optically transparent element to said polished surface;

a pair of photodetectors positioned on opposite sides of a critical angle determined in accordance with a substance the presence of which is to be detected on said polished surface for detecting an intensity of light reflected from said polished surface of said optically transparent element, said photodetectors being positioned such that one of said photodetectors is fully illuminated by light reflected at said critical angle when said substance is present on said surface and the other of said photodetectors is not illuminated by light when said substance is present on said surface;

means for determining a difference in detected reflected light intensity on said pair of photodetectors to determine a change in critical angle of an optical interface at said polished surface and outputting an on/off alarm signal indicative of the presence of said substance on said pol-

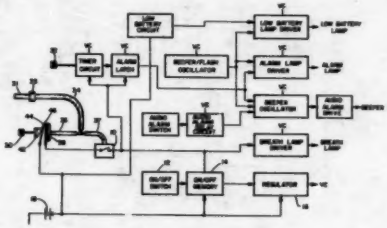
ished surface when said difference reaches a predetermined amount indicative one of said photodetectors being fully illuminated and the other of said photodetectors not being illuminated.

4,803,471

VENTILATOR MONITOR AND ALARM APPARATUS

Robert O. Rowland, Hemet, Calif., assignor to Hudson Oxygen Therapy Sales Co., Temecula, Calif.

Filed Oct. 24, 1986, Ser. No. 923,022
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—626 **8 Claims**



1. A ventilator monitor and alarm apparatus including pressure sensing means for sensing ventilator pressure in a respiratory circuit, alarm means, and electronic circuit means including alarm circuit means cooperating with said pressure sensing means and said alarm means for creating an alarm condition and energizing said alarm in response to failure of said pressure sensing means to detect a preselected minimum pressure in said respiratory circuit, manual on/off switching means for turning the apparatus on and off, and a memory circuit which maintains said apparatus turned on until said manual on/off switching means is actuated to turn said apparatus off, comprising digital logic circuit means cooperating with said pressure sensing means for turning the apparatus on independent of said manual on/off switching means in response to a preselected minimum pressure sensed by said pressure sensing means said digital logic circuit means including means for monitoring the condition of said on/off switching means.

4,803,472

PHASE SIGNAL DETECTING DEVICE

Bruno Murari, Monza; Pietro Menniti, Milan, and Fabio Marchió, Gallarate, all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

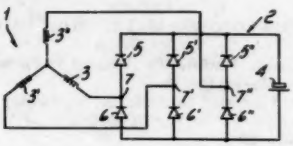
Filed Dec. 8, 1986, Ser. No. 939,328
Claims priority, application Italy, Dec. 10, 1985, 23150 A/85
Int. Cl.[4] H03K 5/00; G08B 21/00
U.S. Cl. 340—658 **4 Claims**

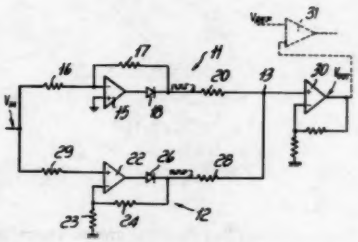
1. In an alternator, in particular for motor vehicles, comprising at least one phase coil, a rectifier bridge including at least two rectifying elements connected in series to each other and defining two opposite terminals and an intermediate tap, and a voltage source connected between said two opposite terminals, said intermediate tap being connected to said phase coil and supplying an alternating substantially rectangular phase signal having positive and negative components,

a phase signal detecting device including active rectifying means having an input connected to said intermediate tap for rectifying said phase signal and generating a rectified output signal with constant polarity,

said active rectifying means comprising:

first amplifier means and second inverting amplifier means mutually arranged in parallel, with said first and second amplifier means having respective amplifier means inputs connected together and to said intermediate tap and respective amplifier means outputs connected together, said first and second amplifier means alternately and selectively amplifying each one of said positive and negative components of said phase signal and alternately generating amplifier means output signals of a same polarity,





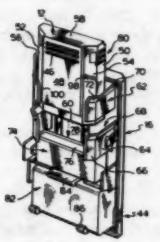
and adder means having an adder means input connected to said amplifier means outputs, said adder means alternately receiving said amplifier means output signals and generating said rectified output signal.

4,803,473

TRANSMITTER COVER

Stephen C. Taylor, Mississauga, Canada, assignor to Dicon Systems Limited, Toronto, Canada

Filed Jan. 20, 1988, Ser. No. 145,928
Claims priority, application Canada, Nov. 9, 1987, 551371
Int. Cl.[4] G08B 23/00
U.S. Cl. 340—693 **6 Claims**



1. A display case for receiving a transmitter module and retaining said module in place, said display case being used in a security system and housing one of many types of sensors or controllers such as fire detectors, door/window open sensors, intrusion detectors, emergency alerts, appliance failure sensors and the like, said transmitter module having a generally rectangular-shaped body portion with front and rear faces, opposing sides and opposing ends, said case having separable case front and case back, said case front having a rectangular-shaped opening provided in its front face as defined by opening edges of said case front, said opening edges being dimensioned to frame said front face of said transmitter module and thereby expose said transmitter module front face through the case

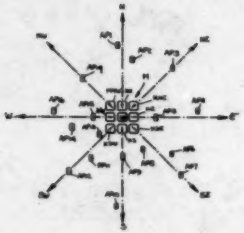
front to indicate presence of said module in said case, said case having means for retaining said module in said case and means for releasably fastening said case front to said case back.

4,803,474

CURSOR CONTROL MATRIX FOR COMPUTER GRAPHICS

George R. Kulp, Hatfield, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Mar. 18, 1986, Ser. No. 840,941
Int. Cl.[4] G09G 3/02
U.S. Cl. 340—709 3 Claims



1. A computer-controlled industrial process control system provided with a plurality of controllable elements each constituted by adjustable means such as a valve, a switch or a control knob and having a computer terminal providing on a screen a graphics display of the system being controlled, each of said controllable elements being represented on the display by an action point whereby a plurality of such action points are dispersed at various positions on the display, and an arrangement making it possible for an operator viewing the screen to select any action point thereon regardless of its position so as to carry out, with the controllable element related thereto, an action appropriate to the selected point; said arrangement comprising:

A. a cursor movable on the display to provide a distinctive symbol thereon;

B. a key matrix manipulatable by the operator to cause the cursor to occupy a position coinciding with any action point on the display, said matrix being constituted by a center key representing home surrounded by eight keys, each having an arrow thereon, the respective arrows on the eight keys being directed to the major axes of a compass rose;

C. means to interlink the key matrix with the cursor to render the center key effectively coincident with a currently selected action point on the display which is then the center of the compass rose, whereby the operator, in order to select a new action point then presses the arrow key which most closely points in the compass rose direction of the desired new action point to cause the cursor to jump one step to the newly selected action point; but if more than one action point lies between the currently selected point and the desired point, the operator must then repeatedly press said arrow key to cause the cursor to jump one step at a time until the cursor rests on the desired action point, said means being constituted by a software routine in which each action point and its coordinates on the screen are entered into a table, whereby each time one of the arrow keys is pressed, a software routine is executed which accepts as its input the currently-selected screen position and one of the eight arrow key directions, and then generates as its output the next screen position to be jumped to, this jump being effected by examining the table of coordinates for the closest entry in the designated direction; and

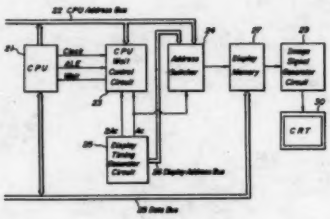
D. an alphanumeric keyboard associated with said computer adjacent to said key matrix whereby the operator may control the selected action point from the keyboard.

4,803,475

IMAGE DISPLAY APPARATUS

Akira Matsueda, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 933,881
Claims priority, application Japan, Dec. 10, 1985, 60-277210
Int. Cl.[4] G09G 1/00
U.S. Cl. 340—750 16 Claims



1. An image display apparatus comprising:

an input/output controlling means for controlling input/output of image information;

a display control means for controlling display of an image;

a display memory which is accessed by said input/output controlling means and said display control means in a time division multiplex mode; and

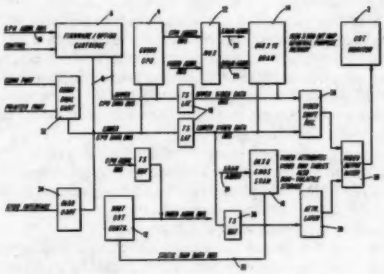
a means connected to said input/output controlling means and said display memory for detecting a time deviation between a start time of a time period during which said display memory can be accessed by said input/output controlling means and a start time of a machine cycle during which said display memory can be accessed by said input/output controlling means to derive a time deviation signal, and for controlling a duration of a wait condition in said input/output controlling means in accordance with said time deviation signal.

4,803,476

VIDEO TERMINAL FOR USE IN GRAPHICS AND ALPHANUMERIC APPLICATIONS

Edward Knapton, Milford, and Ernest Vincent, Windham, both of N.H., assignors to Visual Technology Incorporated, Lowell, Mass.

Filed Oct. 24, 1986, Ser. No. 922,669
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—750 6 Claims



1. A bit-mapped computer terminal comprising:

a display including a plurality of picture elements;

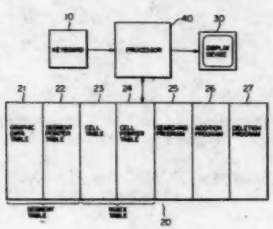
first memory means for storing a display bit map that defines characteristics of individual picture elements of said display;
second memory means for storing attribute information for individual groups of said picture elements of said display;
video control means for selectively lighting individual picture elements of said display in response to said bit map and said attribute information;
a serial communications port having a plurality of electrical contacts;
a receiver including a differential amplifier having a first input and a second input;
a first line coupling one of said electrical contacts with said first differential amplifier input; and
switch means for selectively grounding said second input, said switch means being open for reception of a dual differential data transmission and being closed for reception of a single-ended data transmission.

4,803,477

MANAGEMENT SYSTEM OF GRAPHIC DATA

Takafumi Miyatake, Hachioji; Hitoshi Matsushima, Tachikawa; Shigeko Ohtani, Tokyo, and Junichi Higashino, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1986, Ser. No. 942,633
Claims priority, application Japan, Dec. 20, 1985, 60-285512
Int. Cl.[4] G09G 1/14
U.S. Cl. 340—747 **6 Claims**



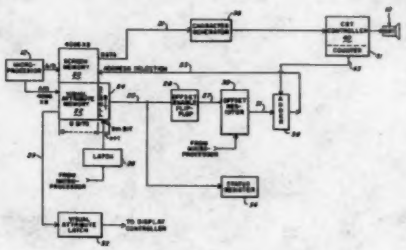
1. A graphic data management system for searching, adding or deleting graphic elements of graphic data comprising:
first memory means for storing coordinate data of characteristic points constituting graphic data which is placed in a multidimensional coordinate space;
means for partitioning said graphic data into cells in accordance with the spatial position of said graphic data, each cell being identified by a cell number;
second memory means for storing indexes which includes information indicative of graphic data contained within each cell, said graphic data is indicated in said index as being within a cell when a graphic element of a line segment or a point of said graphic data passes through said cell and said graphic data is an open figure and when a graphic element of a boundary line of said graphic data passes through said cell or said cell is included within an inner area of said boundary line and said graphic data is a closed figure;
means for obtaining cells within a specified range of said graphic data, said specified range being input to said system by a user of said system in order to specify graphic data to be processed, and for reading out graphic data within said cells of said specified range from said second memory means; and
means for reading out from said first memory means coordinate data corresponding to said graphic data read-out from said second memory means and for determining whether each characteristic point of said coordinate data read-out from said first memory means is within said specified range.

4,803,478

HORIZONTAL SCROLL METHOD AND APPARATUS

Richard Olsen, Littleton, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed Feb. 21, 1986, Ser. No. 831,715
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—726 **12 Claims**



1. In a computer system having a video display screen and means for providing the present screen address, apparatus for providing horizontal scrolling on a character-by-character basis, said apparatus comprising:
video memory means having means for storing multiple data word corresponding to a greater number than screen character locations and including, associated with each data word, n attribute bits for defining various characteristics associated with the character with which the attribute bits are associated,
scroll control memory means associated with said video memory means for storing at least bit n+1 for controlling horizontal scrolling on a character-by-character basis, one of the states of said bit indicating horizontal scrolling of that character and the other state of said bit indicating non-scrolling,
means coupled to an input of said scroll control memory means, for writing into said scroll control memory means an enable bit only in those locations corresponding to characters that are to be scrolled,
means for establishing an offset number under computer control and including an offset register having an enable input,
means coupled from said scroll control memory means to the offset register enable input to enable said offset register when the enable bit is in said horizontal scrolling state,
adder means coupled from said offset register for adding said offset number from said offset register to the present screen address to provide an offset address,
and means for coupling the offset address to the video memory means for display of the character associated with the offset address in the screen address position.

4,803,479

ELECTRICAL PHASE MEASUREMENT MEANS AND METHOD FOR ACCURATE DETERMINATION OF WELL LOGGING CABLE LENGTH

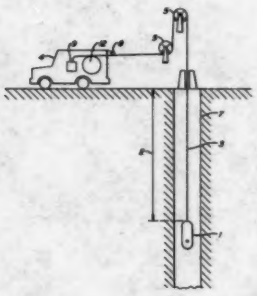
Peter Graebner, Santa Ana; Swan A. Sie, Placentia, and Jorg A. Angehrn, Brea, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 879,854, Jun. 27, 1986, Pat. No. 4,722,603.
This application Oct. 21, 1987, Ser. No. 111,245
Int. Cl.[4] G01V 1/40
U.S. Cl. 340—860 **4 Claims**

1. Apparatus for determining the change in length of a well logging cable holding a tool comprising:
a sinusoidal electrical signal generating means;
a first conductive means of a fixed length;
a second conductive means, said second conductive means

extending downwardly into a wellbore and rigidly connected to the cable;

a third conductive means, said third conductive means extending upwardly from the tool in the wellbore to the surface and operably connected to said second conductive means; and



a means for comparing the phase shift of a signal between said first conductive means and said third conductive means.

means for calculating the change in length of the well logging cable based on said phase shift.

4,803,480

LIQUID CRYSTAL DISPLAY APPARATUS

Mitsuo Soneda, and Yoshikazu Hazama, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

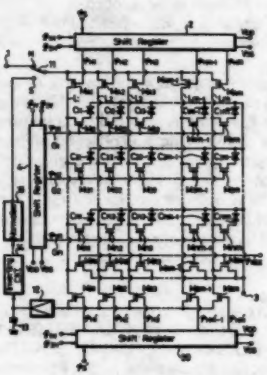
PCT No. PCT/JP85/00508, § 371 Date May 12, 1986, § 102(e) Date May 12, 1986, PCT Pub. No. WO86/01926, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 12, 1985, Ser. No. 871,427

Claims priority, application Japan, Sep. 12, 1984, 59-190783

Int. Cl.[4] G09G *3/36*

U.S. Cl. 340—784 8 Claims



1. In a liquid crystal display apparatus in which video signals are sequentially supplied to a number of conducting column lines corresponding to the number of effective horizontal picture elements through first horizontal switching elements which are turned on by first picture element switching signals, which are sequentially formed at a horizontal picture element period, scanning line switching signals, which are sequentially formed for different horizontal scanning periods and are sequentially supplied to a number of lines corresponding to the number of effective horizontal scanning lines, and a switch means through which said video signals are sequentially supplied to said column lines in a first switch position, a plurality of picture element switching means mounted at intersections between said column lines and row lines and said picture element switching means turned on by said scanning line switching signals, a plurality of liquid crystal cells each of which forms one picture element, said liquid crystal display apparatus being characterized in that second horizontal switching elements, which are driven when said switch is in a second position by second picture element switching signals which have an advanced phase which is advanced relative to said first picture element switching signals and are connected to said column lines, said video signals stored in said liquid crystal cells are obtained during a period in which said second horizontal switching elements are turned on, said signals so obtained are inverted and said inverted signals have a phase which has been delayed by an amount corresponding to said phase advance are sequentially supplied through said first horizontal switching elements to said column lines to thereby display a still picture when said switch is in said second position, and characterized in that a reset voltage is supplied to each of said columns through third switching elements which are turned on at every horizontal blanking period of said video signal.

4,803,481

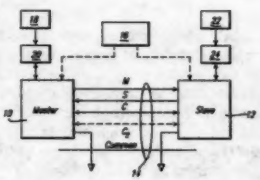
ASYNCHRONOUS COMMUNICATIONS SYSTEM

Peter W. Mueller, Redford, and Jack M. Leason, Royal Oak, both of Mich., assignors to Peaktronics, Inc., Royal Oak, Mich.

Filed Mar. 30, 1987, Ser. No. 33,050

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.5 38 Claims



1. A communications system comprising:

a master;

a slave;

a communication transmission means connecting said master and said slave, the communication means having a master channel, a slave channel and a call channel, said master channel, said slave channel and said call channel each being separate and logically distinct;

said master having circuit means to selectively place said master channel in high and low logical states;

said slave having circuit means to selectively place said slave channel to high and low logical states;

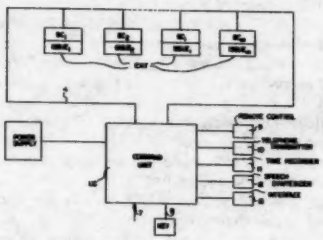
said master and slave having protocol establishing means for enabling said master to control said call channel when said master channel and said slave channel are at a first logical relationship to one another, and for enabling said slave to control said call channel when said master channel and said slave channel are at a second logical relationship to one another.

4,803,482

EXIT CONTROL AND SURVEILLANCE SYSTEM

Alain Verslycken, 3, rue du Val Saint Martin, 77260 La Ferté-sous-Jouarre, France

Filed Feb. 17, 1987, Ser. No. 15,051
Claims priority, application France, Feb. 19, 1986, 86 02359
Int. Cl.[4] G08B *25/00*, *13/08*
U.S. Cl. 340—825.31 5 Claims



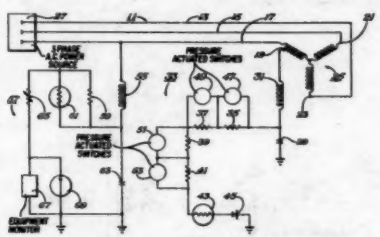
1. An exit surveillance control system for monitoring exits having opening request bars and locks, said system having a central command post from which said system is controlled and a plurality of control boxes, each of said control boxes being associated with an exit and being electrically connected to the control post, said system comprising means responsive to the operation of an opening request bar for initiating a transmission of information to via an associated control box, means responsive to said transmitted information for triggering a first delay period during which the exit in question can be forbidden to open during a second delay period, means for authorizing the opening of the exit in question at the end of either the first delay period or at the end of the second delay period, and means for providing a third delay period which can be triggered during the second delay period in order to authorize the opening of the exit in question during the third delay period by cancelling the effect of the second delay period.

4,803,483

DOWNHOLE PRESSURE AND TEMPERATURE MONITORING SYSTEM

Joseph E. Vandervier, Claremore, and Clinton A. Boyd, Tulsa, both of Okla., assignors to Hughes Tool Company, Houston, Tex.

Filed Jul. 16, 1987, Ser. No. 74,389
Int. Cl.[4] G01V *1/42*
U.S. Cl. 340—856 7 Claims



1. In a submersible pump assembly of the type having an insulated power cable suspended in a well bore, providing AC power from the surface to an electrical motor in the well bore, an apparatus for monitoring the pressure in the well bore, comprising:

source means located at the surface electrically connected to the power cable for superimposing a sensing signal on the power cable;

an electrical network means located in the well bore electrically connected to the power cable for providing an electrical response to the sensing signal;

a plurality of pressure actuated switch means, each switch means for switching from a first condition to a second condition when pressure in the well bore reaches a selected level, the selected level for each switch means differing from the other switch means;

means for connecting each pressure actuated switch means into the electrical network means and for altering the electrical response of the electrical network means when each pressure actuated switch means switches between said first condition and said second condition; and

means at the surface for monitoring the sensing signal to determine the electrical response of the electrical network means and thus determine which of the pressure actuated switch means has switched between said first condition and said second condition, for providing an indication of the well bore pressure level.

4,803,484

OPTICALLY READABLE AND HUMAN READABLE DIAL

Walter L. Schutrum, and Thomas L. Jay, both of Kettering, Ohio, assignors to Energy Innovations, Inc., Dayton, Ohio

Filed Jan. 16, 1987, Ser. No. 4,551
Int. Cl.[4] G08B *23/00*; G08C *15/06*
U.S. Cl. 340—870.02 14 Claims

1. A utility meter reading system, comprising:

meter means for measuring the consumption of a metered utility service or commodity by a consumer, said meter means including a plurality of indicator shafts, the angular positions of which indicate service or commodity consumption,

a plurality of dial means, each such dial means being mounted for rotation on an associated one of said indicator shafts, each such dial means defining

a patterned disc for concentric rotation with a shaft, and

a beveled circumferential surface extending around said patterned disc and bearing a plurality of numerical indicia, and

a noncontact shaft angle detector for detecting the angular positions of said patterned discs, said detector being mounted adjacent said dial means and the angular position of said dial means being viewable with ease from a lateral viewing position by the consumer by virtue of the orientation of the numerical indicia beveled surface.

4,803,485

LAN COMMUNICATION SYSTEM AND MEDIUM ADAPTER FOR USE THEREWITH

Chandos A. Rypinski, Tiburon, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 23, 1987, Ser. No. 28,946
Int. Cl.[4] H04Q *9/00*; H04J *3/00*
U.S. Cl. 340—825.050 24 Claims

1. A medium adapter for use in a communication system

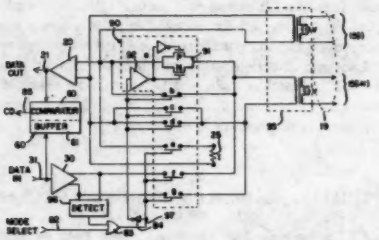
having multiple transmission medium segments in a ring configuration forming a system communication path, comprising:

means for receiving signals from a first transmission medium segment;

means for transmitting signals over the next-successive transmission medium segment;

means for selectively coupling or isolating said transmitting means with respect to said next-successive segment;

means not including said transmitting means operatively connected to said first segment and said next-successive segment for selectively maintaining or breaking the continuity of a segment communication path from said first segment to said next-successive segment; and



means for controlling said transmitter coupling means and said breaking means such that said transmitting means is isolated from said next-successive segment and said breaking means maintains continuity of said segment communication path when said control means is in a first state and wherein said segment communication path assumes a ring topology when said control means is in said first state, and such that said transmitting means is coupled to said next-successive segment and said breaking means breaks the continuity of said segment communication path when said control means is in a second state and wherein said medium adapter is operable to initiate a bus formed over said system communication path when said control mens is in said second state.

4,803,486

MATRIX SWITCH CIRCUIT

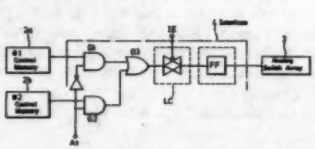
Shinichi Sano; Yasuhito Takeuchi; Yoshiro Tamezumi; Takao Higashikuni, and Tsuyoshi Kakizawa, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

Continuation of Ser. No. 920,999, filed as PCT JP86/00066 on Feb. 14, 1986 published as WO86/05049 on Aug. 28, 1986, abandoned. This application Feb. 22, 1988, Ser. No. 159,487

Claims priority, application Japan, Feb. 15, 1985, 60-27769

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.79 **1 Claim**



1. A delay map former circuit for use in ultrasonography, comprising

an array of a plurality of analog switches disposed at the intersection of a plurality of plurality of vertical and horizontal signal lines;

a first memory means for storing control signals for closing and opening respective ones of the analog switches of said array;

control means for generating an interface enable signal and a most significant address signal; and

interface means connected between said array of analog switches and said first and second memory means and under the control of said control means for selectively controlling said analog switches according to control signals stored in said first and second memory means;

wherein said interface comprises

a first AND circuit connected to said control means and to said first memory means,

a second AND circuit connected to said control means and to said second memory means,

a single switching means connected commonly to said first and second AND circuits and to said control means, and

a single holding means connected to said switching means and to said array; and

wherein said control means applies said most significant signal to said first and second AND circuits to select one of said first and second AND circuits for transmitting control signals therethrough

wherein said control means applies said interface enable signal to said switching means to cause said control signals from the selected one of said first and second memory means to be transmitted through said switching means to said holding means, said holding means holding the transmitted control signals, and then applying the held control signals to selectively control selected ones of said analog switches of said array,

wherein said control means enters control signals into said selected one of said first and second memory means after transmission of stored control signals through said AND circuits and said switching means to said holding means, and

wherein said control means causes control signals stored in another of said first and second memory means to be transmitted through said AND circuits and said switching means to said holding means, after selected control signals are transmitted to said holding means to operate selected ones of said analog switches of said array, so that entering of control signals into said first and second memory means is independent of the selective operation of said analog switches of said array.

4,803,487

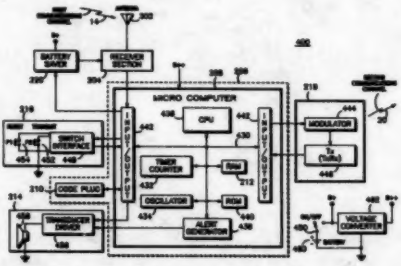
PORTABLE COMMUNICATIONS RECEIVER WITH SEPARATE INFORMATION PRESENTATION MEANS

David F. Willard, Plantation, and Philip P. Macnak, West Palm Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1987, Ser. No. 44,875

Int. Cl.[4] H04Q *7/00*

U.S. Cl. 340—825.440 **40 Claims**



1. A personal message receiving apparatus, for presenting to a user selective call messages, having selective call address and

message information, being transmitted on a first radio frequency communications channel, said device comprising:

a portable communications receiver intended to be carried by the user, said receiver having,

a first receiver portion for receiving and detecting the selective call address and messages information being transmitted on the first radio frequency communications channel,

message storage means responsive to the detected selective call address information for effecting the storing of the received message information, and

transmitter means, coupled to said message storage means, and further responsive to the message information being stored for subsequently transmitting on a second communications channel, the stored message information; and

a presentation unit further intended to be carried by the user, said unit having

a second receiver means, separate from said portable communications receiver, for receiving and detecting the message information transmitted on the second communications channel, and

presentation means, coupled to said second receiver means, for presenting the message information received on the second communications channel.

4,803,488

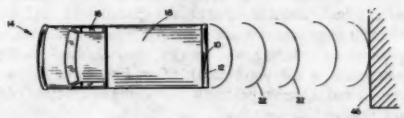
DRIVER ALERTING DEVICE

Anthony E. Dombrowski, Omaha, Nebr., assignor to Steven F. Sommers, Omaha; Bruce E. Schreiner, Grand Island; Land Paving Company, Omaha; Omni Holding Company, Omaha; Jerry Ronk, Omaha and Robert Wichser, Omaha, all of, Nebr.

Continuation of Ser. No. 579,160, Feb. 10, 1984, abandoned. This application Aug. 13, 1986, Ser. No. 895,537

Int. Cl.[4] G08G *1/00*

U.S. Cl. 340—904 **10 Claims**



1. A driver alerting device for a vehicle having a back-up light circuit reverse switch, comprising, a transceiver comprising a micro-wave radar device using the doppler shift principle to detect the present of a target within the transceiver range,

means for supporting said transceiver at the rearward end of a vehicle for directing the wave output thereof rearwardly of the vehicle,

means for supplying to said transceiver return wave signals from any target within the transceiver range, an intermediate frequency amplifier operatively connected to said transceiver, said amplifier being operative to amplify and shape said return wave signals, a remote indicator adapted for placement within or adjacent the passenger compartment of a vehicle,

means for electrically connecting said remote indicator to said transceiver for activation of said indicator in response to detection by said transceiver of return wave signals from any target within the transceiver range, and

means for electrically connecting said transceiver to the back-up light circuit reverse switch of a vehicle for activation of said transceiver in response to activation of said back-up light circuit reverse switch of a vehicle, said device being substantially unaffected, in operation, by varying weather conditions.

4,803,489

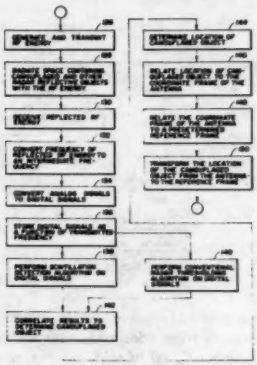
METHOD FOR DETECTING A CAMOUFLAGED OBJECT AND SYSTEM

Francis A. Giori, Williamsville, N.Y., assignor to LTV A&D Sierra Research Division, Buffalo, N.Y.

Filed Jun. 29, 1987, Ser. No. 68,178

Int. Cl.[4] G01S *13/32*

U.S. Cl. 342—192 **17 Claims**



1. A method for detecting by radar an object hidden by camouflage within a predetermined space, wherein the camouflage has apertures extending completely therethrough, the method comprising the steps of:

activating a radar system to generate RF energy radiating the predetermined space containing the camouflage object said RF energy being generated at a frequency swept over a predetermined frequency band so that said generated RF energy radiates through the apertures of the camouflage and is radiated through the apertures after reflection from the object to create an identifiable scintillation in the reflected RF energy;

receiving the reflected RF energy to generate a received RF signal; and

performing a scintillation-detection algorithm on said received RF signal to detect the camouflaged object.

4,803,490

HORIZON STABILIZED ANTENNA BEAM FOR SHIPBOARD RADAR

Bradford E. Kruger, Woodland Hills, Calif., assignor to ITT Gilfillan, A Division of ITT Corporation, Van Nuys, Calif.

Filed Oct. 26, 1984, Ser. No. 665,275

Int. Cl.[4] G01S *13/46*; H01Q *3/46, 1/34*

U.S. Cl. 342—158 **3 Claims**

1.

A shipboard radar system for search, said system comprising:

a gyro;

a pitch sensor connected with said gyro to produce an output signal which is a function of the ship's pitch;

a roll sensor connected with said gyro to produce an output signal which is a function of the ship's roll;

an antenna to radiate a beam of electromagnetic energy;

a Rotman lens actuable to move said beam in elevation;

main means responsive to said pitch and roll sensor output signals to control said Rotman lens in a manner to keep said beam pointed toward the horizon,

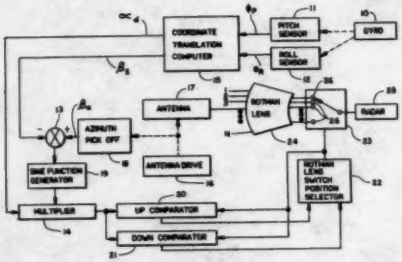
a coordinate translation computer connected to receive said pitch and roll sensor output signals for producing output signals proportional to the deck dip and strike angles;

second means to rotate said antenna in azimuth, an azimuth

angle pick-off, said second means rotating said pick-off with said antenna;

a sine function generator;

a subtractor connected to receive said strike angle output signal of said coordinate translation computer and to receive said pick-off output signal for supplying an input to said sine function generator; and



a multiplier connected to receive said dip angle output signal of said coordinate translation computer and connected to receive the output signal of said sine function generator, the output signal of said multiplier being proportional to the elevation of said antenna beam relative to said gyro independent of a component of said strike angle in the direction of boresite.

4,803,491

ANTENNA FOR WIRELESS COMMUNICATION EQUIPMENT

Hideo Hikuma, Ichikawa, Japan, assignor to Uniden Corporation, Ichikawa, Japan

Filed May 6, 1987, Ser. No. 46,426

Claims priority, application Japan, May 9, 1986, 61-104837

Int. Cl.[4] H01Q 1/24

U.S. Cl. 343—702 **7 Claims**

1. An antenna for wireless communication equipment, said antenna having a feeding point at which sigals are coupled to and from said antenna, comprising:

a conductive main vertical planar part having a first width, standing erect, and having one end thereof connected to the ground;

a conductive main horizontal planar part having a second width, extending at substantially right angles toward said main vertical planar part, and having one end thereof connected to the other end of said main vertical planar part;

a conductive secondary vertical linear part facing toward and extending in parallel to said main vertical planar part, and having one end thereof connected to the feeding point;

a conductive secondary horizontal linear part extending in parallel to said main horizontal planar part, having one end thereof connected to the other end of said secondary vertical linear part, and separated from said main horizontal planar part by a distance selected to provide a predetermined desired impedance at the feeding point; and

a coupling part for electrically connecting the other end of said secondary horizontal linear part to said main horizontal planar part.

4,803,492

VEHICLE WINDOW GLASS ANTENNA

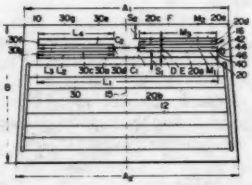
Hiroshi Inabe; Masao Shinnai; Kazuya Nishikawa; Tamotsu Saitoh, and Tokio Tsukada, all of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Nov. 21, 1986, Ser. No. 933,207

Claims priority, application Japan, Nov. 25, 1985, 60-262690; Dec. 13, 1985, 60-279131

Int. Cl.[4] H01Q 1/32

U.S. Cl. 343—713 **12 Claims**



1. A two-element antenna attached to a vehicle window glass having right and left side marginal regions and a middle region containing a center axis of the window glass between said side marginal regions; said antenna comprising:

a main antenna element formed of a conductive strip which extends substantially horizontally from one side marginal region of the window glass to said middle region of the window glass without intersecting said center axis and is folded in said middle region so as to have a turn-back part which extends substantially horizontally toward said one side marginal region;

a phase adjusting antenna element formed of a conductive strip which extends substantially parallel to said main element from said one side marginal region of the window glass along a length not shorter than $(\lambda/4)\alpha-(\lambda/20)\alpha$, wherein λ is the wavelength of an FM wave to be received and is the wavelength shortening coefficient of the antenna; and

an interconnection line which extends within said side marginal region of the window glass substantially perpendicularly to the main and phase adjusting antenna elements and connects an end of said phase adjusting element to an end of said main element, the antenna being electrically connected at an arbitrary point on said interconnection line to a feed point.

4,803,493

MOBILE ANTENNA CIRCUIT WITH VARIABLE LINE LENGTH

Wayne L. Jamison, P.O. Box 75144, Houston, Tex. 77234

Filed Dec. 1, 1986, Ser. No. 936,354

Int. Cl.[4] H01Q 1/10, 3/22

U.S. Cl. 343—745 **12 Claims**

1. A mobile antenna circuit for resonant transmitting from an RF signal source comprising:

an antenna having a base and at least first and second conductive sections, one of said first and second sections being extendable and retractable to lengthen and shorten said antenna;

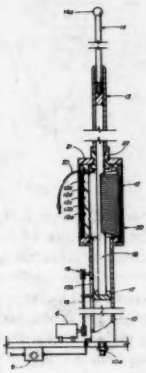
a motor operatively connected to said first antenna section for extending and retracting said antenna in response to control signals thereto;

impedance matching circuit means coupling said RF signal

source to the base of said antenna for matching the impedance thereof at a specified frequency;

control means connected to said motor to produce said control signals for extending and retracting said first antenna section so as to resonantly tune said antenna at said specified frequency;

a phase angle detector connected between said RF signal source and said impedance matching circuit means for developing a voltage differential proportional to the phase shift between RF line voltage and RF line current, said voltage differential being fed to said control means for



producing said control signals to extend and retract said first antenna section to automatically tune said antenna at said specified frequency; and

feed line selection means connected between said phase angle detector and said antenna base by which a specified length of feed line may be placed in series with said impedance matching circuit and in combination therewith create a phase shift between said RF line voltage and RF line current equal to one-quarter or any multiple of one-quarter wave length of feed line for said specified frequency.

4,803,494

WIDE BAND ANTENNA

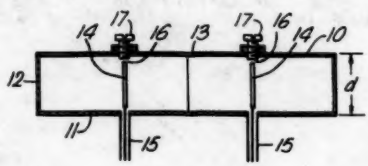
Andrew P. Norris, Great Dunmow, and Martin S. Smith, Chelmsford, both of Great Britain, assignors to STC PLC, London, England

Filed Jan. 20, 1988, Ser. No. 145,930

Claims priority, application United Kingdom, Mar. 14, 1987, 8706114

Int. Cl.[4] H01Q *13/10*

U.S. Cl. 343—770 **3 Claims**



1. A cavity backed crossed slot antenna wherein the cavity depth is less than one eighth of the operating wavelength at the lowest frequency of operation, the major dimension of the cavity in the plane of the slots is less than one half of the wavelength at the lowest operating frequency, and the slots are excited by four capacitive coupled feed probes extending through the bottom wall of the cavity, the probes being located symmetrically with respect to the crossed slots and the ends of the probes being separated from the top wall by gaps to provide the capacitive coupling.

4,803,495

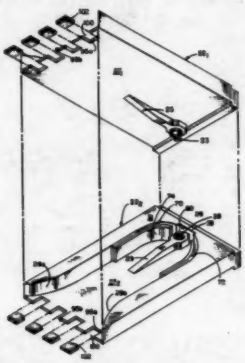
RADIO FREQUENCY ARRAY ANTENNA WITH ENERGY RESISTIVE MATERIAL

George J. Monser, Goleta, and Albert A. Roy, Lompoc, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 690,074, Jan. 9, 1985. This application Nov. 26, 1986, Ser. No. 936,918

Int. Cl.[4] H01Q *3/00, 13/02*

U.S. Cl. 343—777 **8 Claims**



1. An array antenna comprising a plurality of antenna elements, adjacent ones of the plurality of antenna elements having a conductive wall disposed therebetween, said conductive wall being disclosed in the H-plane of the antenna and having a conductive radiating edge having a plurality of discontinuities formed therein, including radio frequency energy resistive material disposed within the regions of the discontinuities.

4,803,496

METHOD FOR RECORDING A COLOR IMAGE

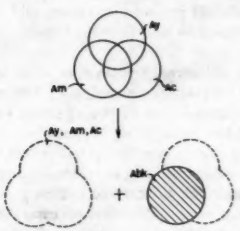
Haruko Kawakami, Funabashi; Hidekazu Sekizawa, Yokohama, and Naofumi Yamamoto, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 30, 1986, Ser. No. 879,943

Claims priority, application Japan, Jun. 28, 1985, 60-142150

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—76 PH **5 Claims**



1. In a method for recording a full color image with the use of three reference color inks of yellow, magenta, and cyan, and a black ink, the black ink being last printed so as to be superim-

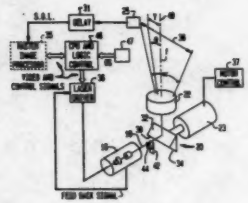
posed on an area in which all the reference color inks are superimposed, an area ratio BK of the black ink occupied relative to a pixel area in a unit pixel is set smaller than area ratios occupied by the respective reference inks superimposed within the unit pixel.

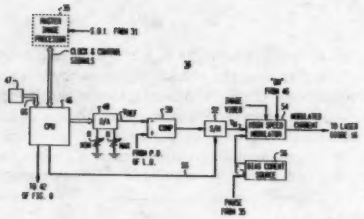
4,803,497

LASER DIODE OUTPUT POWER STABILIZATION IN A LASER IMAGESETTER

John A. Kennedy, Jr., Ridge, and Walter Hansen, Cold Spring Harbor, both of N.Y., assignors to Dr.-Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,681
Int. Cl.[4] G01D *9/42*
U.S. Cl. 346—108 **13 Claims**





8. A method for controlling a multi-resolution mode image setting apparatus including a controllable semiconductor laser diode for providing a light beam, the energy of said light beam having a dependency on an internal temperature within said laser diode, said image setting apparatus further including an apparatus for causing scanning of said light beam after it has been modulated with image-representative information including OFF-states and ON-states, so as to set an image in a selected one of first and second resolutions, said second resolution being greater than said first resolution, comprising the following steps:

(a) keeping said internal temperature at an elevated level during said OFF-states by applying a bias current to said laser diode irrespective of the selection of said first or second said resolution of said apparatus;

(b) electrically controlling the optical power output of said laser diode when changing to said second resolution from said first resolution so that said optical power output is a given amount greater than that necessary for proper setting of said image at said second resolution; and

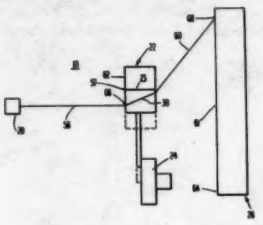
(c) optically attenuating said light beam so as to reduce the optical power of said light beam by said given amount in order that setting of images in said second resolution can take place.

4,803,498

LASER PRINTER RECORDING SYSTEM

Oren Aharon, Haifa, Israel, assignor to Blaser Industries, Incorporated, Los Angeles, Calif.

Filed Jul. 13, 1987, Ser. No. 72,464
Int. Cl.[4] G01D *9/42*; G02B *26/08*
U.S. Cl. 346—108 **2 Claims**



1. A laser printer recording system comprising:

a laser light source for generating a beam of light;

a photoresistive recording medium having an image forming surface disposed perpendicular to the path of said beam of light as it emanates from said light source for recording an image as said beam of light is scanned repetitively across said image forming surface along straight lines;

a transmissive optical unit having a magnification ratio greater than one positioned between said laser light source and said photoresistive recording medium and through which said beam of light passes from said laser light source to said photoresistive recording medium;

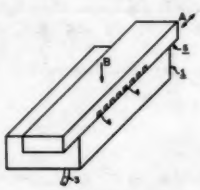
and a slider crank assembly coupled to said transmissive optical unit for imparting oscillatory motion to said transmissive optical unit along a straight-line path parallel to said image forming surface of said photoresistive recording medium to refract said beam of light in increasing amounts as said transmissive optical unit is displaced from the path of said beam of light as it emanates from said light source, thereby scanning said beam of light across said image forming surface along a straight line for each cycle of oscillation of said transmissive optical unit over a distance greater than the distance between the end points of displacements of said transmissive optical unit.

4,803,499

MOVEABLE INK JET THERMAL PRINTING HEAD

Mamoru Hayamizu, Chiba, Japan, assignor to Soartec Corp, Minato, Japan

Filed Feb. 18, 1987, Ser. No. 15,902
Claims priority, application Japan, Feb. 27, 1986, 61-40330; Jul. 15, 1986, 61-164732
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **3 Claims**



1. An ink jet thermal printing head for spraying ink onto a printing surface comprising:

(a) a thermal head having a plurality of thermal dot elements

for creating heat, said thermal head having a recessed portion defining an ink gathering portion;

(b) a guide member slideably mounted for reciprocal movement on said thermal head so as to be in operative engagement with said thermal dot elements, said guide member defining a plurality of grooves in proximity to said thermal dot elements, said plurality of grooves being of greater number than said plurality of thermal dot elements, said reciprocal movement being in a direction substantially perpendicular to said grooves, whereby said reciprocal movement of said guide member relative to said thermal head substantially prevents said grooves from becoming blocked and for maintaining a flow of said ink during operation, wherein said guide member and said thermal printing head form channels therebetween to carry ink from said ink gathering portion of said thermal head to said thermal dot elements, wherein the ink can be heated and caused to bubble and spray the ink out of said channels and onto the printing surface; and,

(c) an ink supplying means for supplying said channels with ink operatively engaged to said guide member so as to supply ink to said ink gathering portion of said thermal head.

4,803,500

INK PRINTER MEANS COMPRISING INTERCHANGEABLE INK HEADS

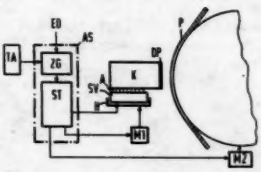
Artur Milbrandt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 24, 1987, Ser. No. 66,069

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622506

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **4 Claims**



1. An ink printer means for multi-color printing of a recording medium comprising an ink printer head provided on a printer carriage movable in line-fashion via a drive means in a print mode, said ink printer head containing a plurality of nozzles from which ink is ejected onto the recording medium to be printed, said nozzles of the ink printer head being individually driven via a multi-color control drive circuit, said ink printer head on the printer carriage being interchangeably mounted via a retaining mechanism, a first type of ink printer head being allocated to single-color ink printing and a second type of ink printer head being allocated to the multi-color ink printing and a sensing means for sensing the type of ink printer head used and, dependent thereon, switching a coding matrix connecting the nozzles to the multi-color drive circuit.

4,803,501

DEVICE FOR GENERATING FLUID DROPS

Klaus Mielke, Mölnlycke, Sweden, assignor to Swedot System AB, Göteborg, Sweden

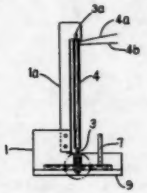
PCT No. PCT/EP86/00281, § 371 Date Feb. 9, 1987, § 102(e) Date Feb. 9, 1987, PCT Pub. No. WO86/06684, PCT Pub. Date Nov. 20, 1986

PCT Filed May 13, 1986, Ser. No. 13,830

Claims priority, application Sweden, May 13, 1985, 8502374-5

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **14 Claims**



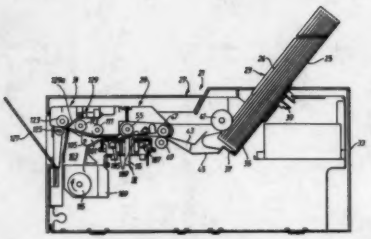
1. A device for generating ink drops, comprising: a housing having walls defining an ink chamber, having an ink supply terminating in said ink chamber, having an ink outlet opening in one of said walls defining said ink chamber, and having in another of said walls an aperture; an elastic sealing element provided in said aperture; a rod-shaped actuation member having a first end portion with an end surface, having a second end portion, and having an intermediate portion extending between said end portions, said actuation member having a longitudinal axis which is aligned with said ink outlet opening, said actuation member being made of a magnetostrictive material; and a magnetizing coil, said actuation member varying dimensionally in response to a magnetic field applied thereto by said magnetizing coil; wherein said actuation member extends through said sealing element and said aperture so that its first end portion extends into said ink chamber while its second end portion lies outside said ink chamber, said actuation member being supported by support means on said housing at a location spaced from said first end portion while having said end surface on its first end portion facing toward the vicinity of said ink outlet opening; wherein said intermediate portion and said second end portion of said actuating member are disposed outside said ink chamber; wherein said actuation member is supported by said support means at said second end portion so that solely said first end portion extends into said ink chamber; wherein said housing includes a support portion and said support means includes a yoke-shaped portion supporting said second end portion of said actuation member; and wherein said yoke-shaped portion is made of a magnetostrictive material which responds to the influence of the magnetic fields produced by said magnetizing coil oppositely to said magnetostrictive actuation member, by respectively expanding and contracting dimensionally in directions parallel to said longitudinal axis of said actuation member as said actuation member respectively contracts and expands dimensionally parallel to said longitudinal axis.

4,803,502

IMAGE FORMATION CARTRIDGE AND IMAGE FORMING APPARATUS USING THE SAME

Kiyoshi Hashimoto, Ichikawa; Kazuhisa Kimura, and Takashi Hatakeyama, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 30, 1987, Ser. No. 103,129
Claims priority, application Japan, Sep. 30, 1986, 61-232365
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 20 Claims



1. A detachable image formation cartridge for an image formation apparatus having a thermal head, comprising:

a movable image formation sheet including an ink permeable portion;

a pair of rotatable shaft means for supporting the image formation sheet therebetween, the image formation sheet being alternatively wound on each of the rotatable shaft pair means as the shaft pair means rotate in corresponding alternate directions;

rotatable ink applying roller means for contacting the image formation sheet and rolling along the image formation sheet as the rotatable shaft means wind the image formation sheet for transferring ink to the image formation sheet; and

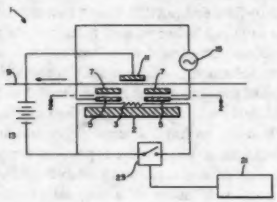
ink feeding means for drawing ink from a supply thereof and for uniformly applying the drawn ink to the surface of said roller means along at least a portion of the length thereof.

4,803,503

THERMALLY ACTIVATED ELECTROSTATIC CHARGING METHOD AND SYSTEM

Edward F. Mayer, Cromwell, Conn., assignor to Ricoh Corporation, San Jose, Calif.

Filed Nov. 27, 1987, Ser. No. 125,896
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—159 18 Claims



1. A method of forming an electrostatic image on a solid dielectric material comprising the steps of:

applying a first potential to a first electrode adjacent the dielectric material,

applying a time varying potential to a second electrode adjacent an opposite side of said dielectric material from said first electrode,

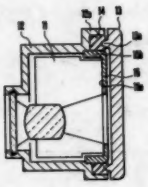
selectively heating gases in the region of said second electrode to selectively generate ions in the region of one of said electrodes to form the electrostatic image on the dielectric material, whereby the magnitude and frequency of the time varying potential are selected such that substantially no ionization will occur unless the region between said first and second electrodes has been heated.

4,803,504

WATERPROOF CAMERA

Hiroshi Maeno, and Hideo Tamamura, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 772,147, Sep. 3, 1985, abandoned. This application Dec. 23, 1987, Ser. No. 136,477
Claims priority, application Japan, Sep. 3, 1984, 59-132682; Sep. 3, 1984, 59-132683; Sep. 3, 1984, 59-132684
Int. Cl.[4] G03B *17/08*
U.S. Cl. 354—64 30 Claims



25. A camera, comprising:

(A) a camera cover having an aperture part for loading photosensitive means;

(B) a lid for covering said aperture part for loading photosensitive means;

(C) sealing means for tightly closing said aperture part when said lid is closed; and

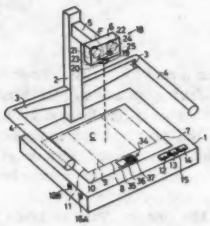
(D) a camera body covered by said camera cover, said camera body constituting together with said camera cover a holding part for holding said sealing means.

4,803,505

MICROFILM CAMERA

Takao Saijo, Tama, and Masafumi Fujita, Kawasaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 1, 1987, Ser. No. 91,987
Claims priority, application Japan, Sep. 3, 1986, 61-207059; Sep. 3, 1986, 61-207060
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—80 11 Claims



1. A microfilm camera for photographing images of documents on a film on a reduced scale, comprising:

a document table for placing the document thereon;

optical means for projecting an image of the document

placed on the document table onto the film by reduction in scale to photograph the image thereon;

restricting means positioned in the optical path of said optical means for restricting an area on the film to be exposed to light by the optical means, said restricting means being capable of varying the area;

forming means for forming variable size marks indicative of the size of the photographed image, on the film, in the vicinity of each film image photographed;

input means for inputting the size of the area which is to be restricted by said restricting means; and

control means for controlling the restricting means and the forming means with a predetermined relationship to each other to vary the restricted area and the size mark corresponding to the size inputted by said input means.

4,803,506

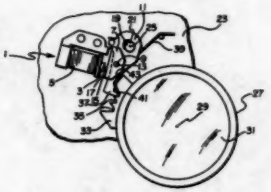
ELECTROMAGNETIC CONTROL DEVICE FOR CAMERAS

Conrad Diehl, and Anthony DiRisio, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 14, 1988, Ser. No. 143,789

Int. Cl.[4] G03B 3/00

U.S. Cl. 354—400 **6 Claims**



1. An improved electromagnetic control device for a camera or other photographic apparatus, wherein said control device is of the type provided with (a) a control member, (b) magnet means having an attracting face, (c) an armature pivotally connected to said control member for movement about a pivot axis to allow tilting of an attracted face of said armature into face contact with said attracting face of the magnet means, and (d) means pivotally mounting said control member for movement about a pivot axis to swing said armature to urge its attracted face against said attracting face of the magnet means until said attracted face is tilted into face contact with said attracting face, and wherein the improvement comprises:

some mounting means including free play means for allowing some degree of free play of said control member at its pivot axis to, in turn, allow the control member to move about the pivot axis of said armature after said attracted face of the armature is tilted into face contact with said attracting face of the magnet means, whereby said control member will be moved first about its pivot axis and then about the pivot axis of said armature.

4,803,507

AUTOMATIC FOCUSING DEVICE

Akira Akashi, and Masanori Yamada, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 696,878, Jan. 31, 1985, abandoned, which is a continuation of Ser. No. 558,768, Dec. 6, 1983, abandoned. This application Oct. 1, 1985, Ser. No. 783,056

Claims priority, application Japan, Dec. 7, 1982, 57-214405; Jan. 26, 1983, 58-11052

Int. Cl.[4] G03B 3/00

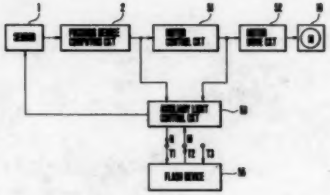
U.S. Cl. 354—400 **13 Claims**

1. An automatic focusing device comprising:

(a) a focus detecting circuit arranged to repeatedly measure a focus state of an object to be photographed and illuminated with an auxiliary light in response to an illumination start signal which is produced for driving an auxiliary light source, whereby said auxiliary light source is repeatedly actuated for illuminating the object for each focus detecting action;

(b) lens driving circuit for driving a lens on the basis of detecting results after each focus state detecting action by said focus detecting circuit is completed, said driving circuit driving the lens an amount corresponding to the detection results and stopping the lens, and said focus detecting circuit operating again in synchronism with the illumination start signal while the lens is stopped; and

(c) an inhibiting circuit arranged to inhibit the actuating



action of said illumination start signal on said auxiliary light source when an in-focus is detected by said detecting circuit, whereby a re-starting of said auxiliary light source is inhibited in response to a detection of an in-focus state, thus stopping the repeated illumination.

9. An automatic focusing device comprising:

(a) a detection circuit for detecting a focus state of an object to be photographed repeatedly at a predetermined interval of time;

(b) a driving circuit for driving a lens to an in-focus state on the basis of an output of the focus detection circuit; and

(c) a control circuit for rendering longer the detection interval of the focus detection circuit after the in-focus state is attained than before.

4,803,508

FOCUS DETECTION SYSTEM AND LIGHTING DEVICE THEREFOR

Tohru Matsui, Sakai, and Takeshi Egawa, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 940,190, Dec. 9, 1986, Pat. No. 4,690,538, which is a continuation of Ser. No. 807,642, Dec. 11, 1985, abandoned. This application Aug. 13, 1987, Ser. No. 85,088

Claims priority, application Japan, Dec. 11, 1984, 59-261194; Jan. 17, 1985, 60-7178; Jan. 19, 1985, 60-7686; Jan. 21, 1985, 60-9716

Int. Cl.[4] G03B 3/00

U.S. Cl. 354—403 **4 Claims**

1. A focus detection system for detecting focus condition of an objective lens of a camera with respect to an object within a focus detection area which spreads at a solid angle centering at the optical axis of said objective lens, comprising:

a light projecting optical system for projecting a flux of light which crosses said focus detection area at a predetermined angle;

a light source for emitting light, said light source including:

a light emitting diode adapted to emit said light from its front surface and its side surfaces;

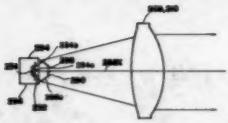
a transparent molded member disposed in front of said front surface of said light emitting diode and having a spherical surface;

a concave light reflective member surrounding said side surfaces of said light emitting diode to reflect said light emitted from said side surfaces of said light emitting diode towards said transparent molded member;

a projective pattern including a plurality of alternatively arranged transparent portions and opaque portions; and

a projecting lens for projecting said light forward as said flux of light, wherein said light source fulfills the following conditions:

$0.6<l/R<1.1$



$l=h-R$

wherein: h represents a distance between the top of the spherical surface of the transparent molded member and the front face of the light emitting diode; and R represents a radius of curvature of the transparent molded member.

4,803,509

CAMERA SYSTEM OPERABLE BY CARRYING DATA FROM A CAMERA ACCESSORY TO A CAMERA BODY

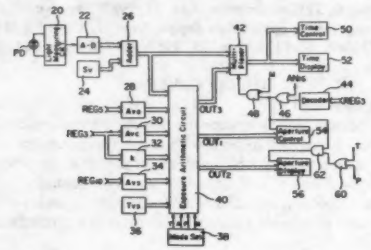
Masaki Nakai, Kawachinagano; Masayoshi Sahara, Sennan, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 578, Jan. 5, 1987, abandoned, which is a division of Ser. No. 790,511, Oct. 23, 1985, Pat. No. 4,673,275, which is a continuation of Ser. No. 478,910, Mar. 25, 1983, Pat. No. 4,560,267. This application Dec. 9, 1987, Ser. No. 130,990

Claims priority, application Japan, Mar. 26, 1982, 57-49768; Mar. 30, 1982, 57-52740; Apr. 1, 1982, 57-55187; Nov. 5, 1982, 57-194968; Feb. 2, 1983, 58-14929[U]

Int. Cl.[4] G03B 7/095, 7/20

U.S. Cl. 354—410 **4 Claims**



1. In a camera system having a camera body with a mount on which a first type of attachment, subject to an aperture size adjustment from the camera body, or a second type of attachment, incapable of the aperture size adjustment from the camera body, can be interchangeably mounted, the camera body comprising:

first means for controlling an exposure of the camera in accordance with a manual setting;

second means for controlling an exposure of the camera in accordance with a fully open aperture through the lens (TTL) light measurement;

third means for controlling an exposure of the camera in accordance with an actually stopped-down aperture TTL light meaurement;

means for identifying whether the attachment mounted on the mount is of the first type or of the second type, and

means, responsive to said identifying means, for enabling said first and second controlling means when said identifying means identifies that the mounted attachment is of the first type, and for enabling said third controlling means when said identifying means identifies that the mounted attachment is of the second type.

4,803,510

COPYING MACHINE HAVING REMOVABLE PROCESS UNIT IN A HOUSING

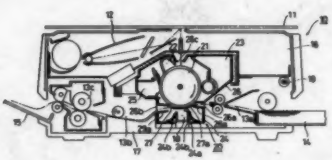
Masahiko Maeda, Izumiotsu, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 27, 1987, Ser. No. 19,721

Claims priority, application Japan, Feb. 28, 1986, 61-29917[U]; Feb. 28, 1986, 61-29918[U]; Feb. 28, 1986, 61-29919[U]; Feb. 28, 1986, 61-45050; Feb. 28, 1986, 61-45051; Feb. 28, 1986, 61-45052; Feb. 28, 1986, 61-45053; Feb. 28, 1986, 61-45054

Int. Cl.[4] G01G 15/00

U.S. Cl. 355—3 R **18 Claims**



1. A copying machine comprising the body of said copying machine and a process unit attachable to and detachable from the body of said copying machine, wherein said process unit comprises a generally closed housing, and a photosensitive drum, a charging device, a developing apparatus, and a cleaning apparatus completely within said housing of said process unit, said process unit having a route of conveyance for recording paper that tunnels through said housing in the region under said photosensitive drum; and the shape of the housing of said process unit is a right-angled parallel-piped.

4,803,511

SLIDING PLATE ASSEMBLY

Peter G. Izzo, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

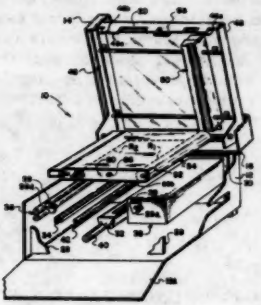
Continuation of Ser. No. 93,847, Sep. 8, 1987, abandoned. This application May 10, 1988, Ser. No. 195,481

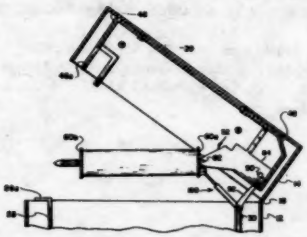
Int. Cl.[4] G03G 15/00

U.S. Cl. 355—3 R **5 Claims**

1. In an improved electrostatographic apparatus including a housing having a lower portion containing electrostatographic process stations and an upper portion connected thereto containing a support assembly for a dielectric member mounted for movement about a closed loop path, and wherein said upper housing portion is movable relative to said lower housing portion to a first position whereby said dielectric member is in operative relation to such electrostatographic process statons and a second position wherein said dielectric member is remote from said electrostatographic process stations to enable ready access to such process stations, and wherein said dielectric member support assembly is movable relative to said upper housing portion to a position intermediate said upper and lower housing portions when said upper portion is in its second position, said improvement comprising:

means for inhibiting movement of said upper housing portion from its second position to its first position when said





dielectric member support assembly is in its intermediate position, whereby damage to said dielectric member by movement of said upper housing portion is prevented.

4,803,512

IMAGE FORMING CARTRIDGE FOR PROVIDING UNIFORM CORONA CHARGING

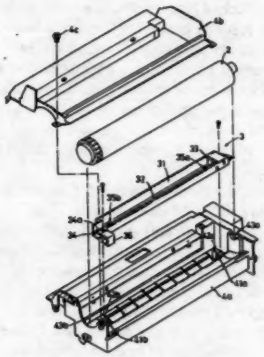
Mitsuru Ogura, Nara; Takeshi Yoshida, and Shoichiro Yoshiura, both of Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 14, 1987, Ser. No. 49,512

Claims priority, application Japan, May 16, 1986, 61-74214[U]

Int. Cl.[4] G03G *15/00, 15/02*; H01T *19/00*

U.S. Cl. 355—3 CH **3 Claims**



1. An image forming cartridge for housing and supporting at least a charger unit integrally with a photoreceptor within a copying machine, comprising an image forming cartridge body having an upper frame and lower frame, a photoreceptor mounted on said cartridge body, a charger unit mounted on said upper frame of said cartridge body said charger unit including a charge wire extending longitudinally in said charger unit, said upper frame of said cartridge body having positioning members of a predetermined height projecting therefrom and said charger unit has holes therein corresponding to said positioning members such that said positioning members extend through said corresponding holes so as to engage said charge wire and maintain said charge wire at a specified distance from said photoreceptor to permit uniform charging of said photoreceptor by said charge wire.

4,803,513

TONER SUPPLYING DEVICE

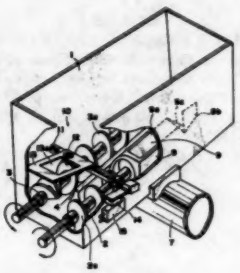
Hideya Nishise, Toyohashi; Susumu Sakakibara, Toyokawa, and Masaru Imaizumi, Shinshiro, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1987, Ser. No. 7,897

Claims priority, application Japan, Jan. 28, 1986, 61-011317[U]

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—3 DD **7 Claims**



1. A toner supplying device for supplying toner to an electrostatic latent image developing unit, said toner supplying device comprising:

a storage tank for accommodating a toner therein;

a first transport member disposed within said storage tank for transporting the toner;

a second transport member disposed within said storage tank for transporting the toner in a direction opposite to the direction of transporting by said first transport member;

a supply opening in the bottom of said storage tank below said first transport member for passing said toner therethrough; and

a cover covering said supply opening and defining a tunnel in which said first transport member is at least partially disposed for partially restricting the flow of toner through said supply opening.

4,803,514

MULTI-COLOR IMAGE FORMING METHOD AND APPARATUS

Seiichiro Hiratsuka; Satoshi Haneda, and Hisashi Shoji, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

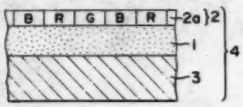
PCT No. PCT/JP85/00588, § 371 Date Aug. 5, 1986, § 102(e) Date Aug. 5, 1986, PCT Pub. No. WO86/02745, PCT Pub. Date May 9, 1986

PCT Filed Oct. 21, 1985, Ser. No. 874,177

Claims priority, application Japan, Oct. 22, 1984, 59-220387; Nov. 13, 1984, 59-237581; Dec. 5, 1984, 59-255795

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 8 Claims



1. A method of forming a multicolor image by repeating such whole-surface exposure and development on a multicolor image forming photosensitive member, which has: an insulating layer on one side of a photoconductive layer; a conductive layer on the other side, at least one of said insulating layer and said conductive layer being light transmissive and comprising a plurality of kinds of filters, as will produce a potential pattern in a portion of a specific kind one of the filters of said photosensitive member, after said photosensitive member has been charged and subjected to an image exposure, characterized in that said photosensitive member is recharged before the second and layer whole-surface exposure so that the surface potential of the photosensitive member is made uniform substantially and at least one of said image exposing, whole-surface exposing and developing steps is made variable to control the color reproduction of said multicolor image.

4,803,515

IMAGE FORMING APPARATUS

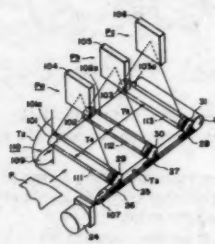
Osamu Hoshino, and Kazuyoshi Chiba, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1987, Ser. No. 67,539

Claims priority, application Japan, Jul. 3, 1986, 61-155134; Jul. 3, 1986, 61-155135

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 12 Claims



1. An image forming apparatus, comprising:

a movable image bearing member;

driving means for driving said image bearing member;

means for forming a latent image on said image bearing member;

developing means for developing the latent image formed on said image bearing member by said latent image forming means; and

means for transferring a developed image developed by said developing means onto an image receptor;

wherein the time interval required for said image bearing member to move from a latent image forming position at which said latent image forming means forms the latent image on said image bearing member to a transfer position at which said transfer means transfers the developed image onto the image receptor is an integer multiple of a period of a drive non-uniformity inherent in said driving means.

4,803,516

COLOR IMAGE FORMING APPARATUS WITH COLOR INFORMATION DETECTION

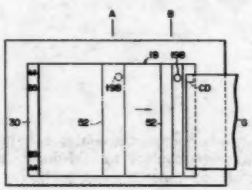
Junji Watanabe, and Hirobumi Kessoku, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

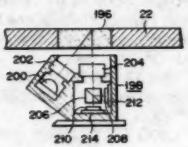
Filed Jun. 26, 1987, Ser. No. 66,555

Claims priority, application Japan, Jun. 30, 1986, 61-153527

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 14 Claims





1. An image forming apparatus comprising:

latent image forming means for forming a latent image corresponding to an image of a document, said latent image forming means comprising a photosensitive member, said photosensitive member being arranged such that light corresponding to the image of the document is incident thereon to attenuate a charge after a surface thereof is uniformly charged, thereby forming a latent image on said surface;

a plurality of developing means for developing the latent image using different color agents;

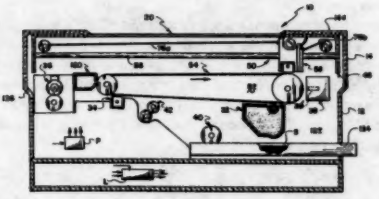
detecting means for detecting developing-color information which is provided on the document and represents one of the color agents to be used for developing the latent image, said developing-color information having a color of a wave length which provides higher sensitivity than that of said photosensitive body and is not formed as a latent image on said surface of said photosensitive body; and

selecting means for selecting one of said plurality of developing means on the basis of the developing-color information.

4,803,517
MULTI-MODE ELECTROPHOTOGRAPHIC REPRODUCTION APPARATUS

William H. Bruce, Jr., Walworth, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1987, Ser. No. 81,765
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 CH 11 Claims



1. Apparatus utilizing a photoconductive member mounted for movement about a closed loop path through electrophotographic process stations for electrophotographically reproducing electronically generated information or information from a document, said apparatus comprising:

means, located in fixed relation to said photoconductive member closed loop path, for producing images from signals corresponding to electronically generated information;

means, operatively associated with said photoconductive member, for supporting a primary charger, a lamp and a lens assembly for movement relative to a transparent document-supporting platen, said primary charger located relative to said lamp so as to be immediately upstream thereof in the direction of movement of said photoconductive member about it's closed loop path; and

means for controlling movement of said photoconductive member and said supporting means whereby during reproduction of a document, said photoconductive member is held stationary while said supporting means is moved to expose said member to a reflected light image of a document on such platen and said primary charger is activated as said supporting means is moved to uniformly charge said photoconductive member prior to exposure, and during reproduction of electronically generated information, said supporting means being held stationary and said photoconductive member is moved past said image producing means, said primary charge being activated to uniformly charge said photoconductive member as said member moves past said supporting means prior to moving past said image producing means.

4,803,518
APPARATUS FOR FORMING A MULTI-COLOR TONER IMAGE

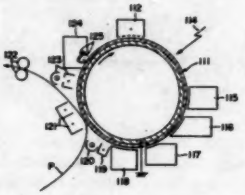
Satoshi Haneda; Hisashi Shoji, and Seiichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

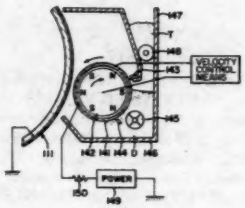
Continuation of Ser. No. 838,247, Mar. 10, 1986, abandoned, which is a division of Ser. No. 751,749, Jul. 2, 1985, Pat. No. 4,666,804. This application Aug. 7, 1987, Ser. No. 83,870
Claims priority, application Japan, Jul. 6, 1984, 59-139974; Jul. 6, 1984, 59-139975
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—4 19 Claims

1. An apparatus for forming a toner image on an image retainer comprising image forming means for forming a latent image by uniformly charging said image retainer and by imagewise exposing said image retainer, a plurality of negative developing means for developing at least one latent image using different colored toners, whereby said toners are provided only on irradiated area of said image retainer, switching means for switching to a first mode and a second mode;

when said apparatus is in said first mode, a latent image is formed by said means for forming a latent image and developed by at least two developing means in a non-contact manner, a first controlling means, responsive to said switching means, operative to cause one of said developing means to develop said latent image and to form a first color image, said first controlling means operative to cause at least one other of said developing means to develop said latent image to form a second color image on said first color image, whereby said toner image is formed;

when said apparatus is in said second mode, imagewise





exposing said image retainer to form a first latent image, a second controlling means, responsive to said switching means, operative to cause one of said developing means to form an unfixed third color image, said second controlling means operative to cause said image forming means to form a second latent image in the presence of said third unfixed color image, said controlling means operative to cause one other of said developing means to form a fourth unfixed color image on said third unfixed color image, whereby said toner image is formed, each said latent image being separately developed using a predetermined means selected from a plurality of said developing means and means for transferring said toner image to an image receiver and fixing said image thereon.

4,803,519
ELECTROPHOTOGRAPHIC COPYING MACHINE WITH DOCUMENT-WINDING DRUM AND DOCUMENT TABLE

Atsushi Asada, and Shunju Anzai, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 711,822, Mar. 14, 1985, abandoned. This application Dec. 16, 1987, Ser. No. 134,203
Claims priority, application Japan, Mar. 15, 1984, 59-50721
Int. Cl.[4] G03G *15/04*
U.S. Cl. 355—8 14 Claims

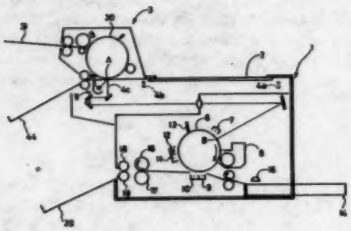
1. An electrophotographic copying machine including:

a document table having a support surface for supporting a first document to be copied;

a document drum for receiving and winding a second sheet-

like document thereon to be copied positioned at the same level of the support surface of said document table;

a substantially planar reciprocating light scanning source positioned relative to each of said document drum and document table so that by selective movement of said light scanning source either of said first or second documents can be scanned by said light scanning source, said light



scanning source being positioned when not in operation between said document table and said drum with said document drum being positioned at one extremity of the range of movement of said light scanning source; and

selection means for operating said light scanning source to selectively scan either of said first or said second documents.

4,803,520

ELECTROPHOTOGRAPHIC APPARATUS FOR MAKING SUPERPOSED IMAGES

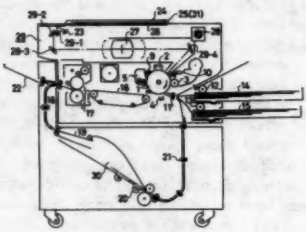
Masahiro Tomosada, Kawasaki; Hiroshi Ogawa; Yoshikuni Tokyama, both of Yokohama; Hideki Adachi, Kawasaki; Tadashi Suzuki, Yokohama, and Naoyuki Ohki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

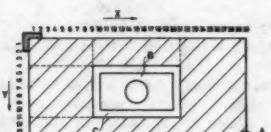
Filed Oct. 31, 1985, Ser. No. 794,399

Claims priority, application Japan, Nov. 7, 1984, 59-234345

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—7 **53 Claims**





1. An image forming apparatus comprising:

area designating means for designating a desired image area of an original, wherein in said area designating means outputs area information indicating said designated area;

exposing means for exposing said original;

image forming means for forming an image corresponding to said original exposed by said exposing means; and

control means for controlling said image forming means such that after an image of a first area corresponding to said area information output from said area designating means is formed on area recording sheet, an image of a second area corresponding to said area information output from said area designating means is formed on said recording sheet;

wherein said control means comprises blank margin forming means for forming a blank margin at the boundary between said images of said first area and of said second area by erasing a portion of said image of said first area when forming said image of said first area or erasing a portion of said image of said second area when forming said image of said second area.

4,803,521

PROCESS KIT AND IMAGE FORMING APPARATUS USING THE SAME

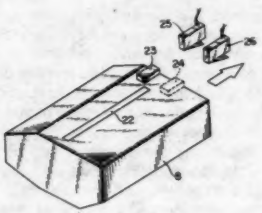
Haruhisa Honda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 435,956, Oct. 22, 1982, abandoned. This application Sep. 9, 1987, Ser. No. 96,250

Claims priority, application Japan, Oct. 29, 1981, 56-173555

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—14 R **22 Claims**



1. A process kit receivable into an image forming apparatus having a main body portion, comprising:

process means including a photosensitive member and means actable thereon for repetitive image formation, for cooperating with means of the image forming apparatus to form images repetitively on image transfer material;

supporting means for supporting said process means as a kit; and

signal source means disposed on said process kit for indicating to the main body of said image forming apparatus information corresponding to a processing property of said process means within the kit, for use by said main body to provide a display indicating said property so as to visually confirm said property.

4,803,522

SHEET REFEEDING APPARATUS

Hiromu Sasaki, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 16, 1987, Ser. No. 62,838

Claims priority, application Japan, Jun. 16, 1986, 61-140499

Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—26 **9 Claims**

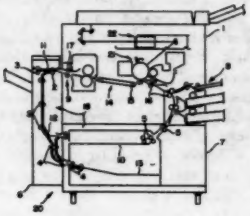
1. A sheet refeeding apparatus for use in combination with an image forming system including an image forming device having sheet conveying means forming a sheet conveying path between the sheet feed section and the sheet discharge section, said sheet refeeding apparatus comprising:

secondary sheet conveying means;

variable speed driving means for regulating the operating speed of said secondary sheet conveying means;

control means, responsive to said image forming system, for controlling an operating mode and said variable speed driving means;

memory means storing a plurality of control data for controlling said variable speed driving means; and



selecting means for selecting control data for controlling said variable speed driving means so that said secondary sheet conveying means operates synchronously with said sheet conveying means of the image forming device from among those control data stored in said memory means.

4,803,523

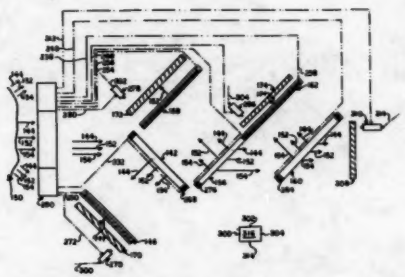
MEANS AND METHOD FOR COLOR SEPARATION AND FOR REPRODUCTION

Robert E. Pearson, Portland, Oreg., assignor to T. W. Secrest, Chehalis, Wash., a part interest

Division of Ser. No. 718,886, Apr. 2, 1985, Pat. No. 4,668,078, which is a continuation-in-part of Ser. No. 419,304, Sep. 17, 1982, Pat. No. 4,509,854, which is a continuation-in-part of Ser. No. 399,805, Sep. 24, 1973, Pat. No. 4,355,888. This application May 13, 1987, Ser. No. 49,771

Int. Cl.[4] G03B *27/32, 27/52, 5/23;* G02F *1/01*

U.S. Cl. 355—32 **15 Claims**



1. A means for controlling electromagnetic wave energy to realize desired wave length light waves, said means comprising:

a. a control responsive to light waves;

b. said control in response to said light waves, controlling the electromagnetic wave energy to realize said desired wave length light waves;

c. said control being a filter;

d. said control comprising a sensor responsive to said light waves;

e. said sensor conveying information to a unit for directing electromagnetic waves onto said filter and the intensity of said electromagnetic waves controlling the optical density of the filter;

f. a means for converting said desired wave length light waves to analogue information;

g. a display; and,

h. a means for processing said analogue information into a form for displaying in said display.

4,803,524

METHOD OF AND APPARATUS FOR DETECTING THE ACCURACY OF SUPERPOSITION EXPOSURE IN AN EXPOSURE APPARATUS

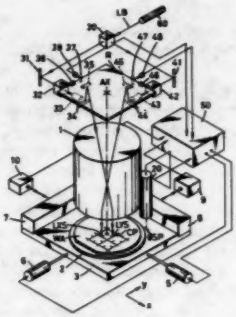
Koichi Ohno, Kanagawa; Kenji Higashi, Saitama, and Hiroki Tateno, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 889,785, Jul. 28, 1986, abandoned. This application Jun. 9, 1987, Ser. No. 60,021

Claims priority, application Japan, Aug. 3, 1985, 60-171419; Jun. 9, 1986, 61-131902

Int. Cl.[4] G03B *27/42*

U.S. Cl. 355—53 **21 Claims**



1. An apparatus having stage means on which a substrate is placed, holding means for holding a mask formed with at least one mark, and exposing means for exposing the image of said at least one mark on the exposure surface of said substrate which is coated with photoresist, said apparatus including:

(a) displacing means for imparting relative displacement between said stage means and said holding means;

(b) control means for controlling said exposing means and said displacing means and executing a first exposure and a second exposure successively, said control means executing said first and said second exposure by exposing the image of said at least one mark on a plurality of predetermined areas of the exposure surface of said substrate placed on said stage means, and controlling said exposing means and said displacing means so that the amount of deviation between the position of the image of said at least one mark in each of said plurality of predetermined areas during said first exposure and the position of said image during said second exposure assumes a predetermined value;

(c) developing means for developing said substrate in response to the termination of said second exposure;

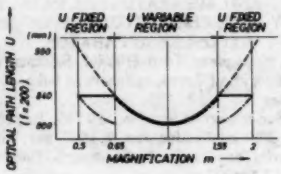
(d) deviation amount detecting means for detecting the amount of deviation between the position of the image of said at least one mark in each of said plurality of predetermined areas of said developed substrate during said first exposure and the position of said image during said second exposure and producing a detection signal; and

(e) determining means for determining the accuracy of said apparatus in accordance with said detection signal and said predetermined value.

4,803,525
VARIABLE MAGNIFICATION COPYING MACHINE

Mitsuru Nagoshi, Hachioji, Japan, assignor to Konishiroku Photo Industry Company Ltd., Shinjuku, Japan

Filed Nov. 21, 1986, Ser. No. 933,416
Claims priority, application Japan, Dec. 3, 1985, 60-271894
Int. Cl.[4] G03B 27/52; G03G 15/28
U.S. Cl. 355—55 12 Claims



1. A variable magnification system capable of achieving any magnification throughout a variable magnification range, comprising:

means defining an original object;

means upon which an image of said original object is to be formed;

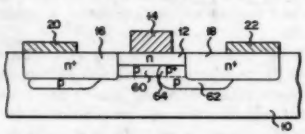
mirror means, and lens means defining a plurality of focal lengths, interposed between said original object means and said image-forming means, for defining an optical path between said original object means and said image-forming means which is variable in length; and

means for varying said optical path length while fixing said focal length of said lens means at a predetermined one of said plurality of focal lengths within a first predetermined portion of said variable magnificaton range so as to achieve any one of said magnification values within said first predetermined portion of said variable magnification range, and for fixing said optical path length at a predetermined value while varying said focal length of said lens means during a second predetermined portion of said variable magnification range so as to achieve any one of said magnification values within said second predetermined portion of said variable magnification range.

4,803,526
SCHOTTKY GATE FIELD EFFECT TRANSISTOR AND MANUFACTURING METHOD

Toshiyuki Terada, Kawasaki; Mayumi Hirose, and Kenji Ishida, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 781,930, Sep. 30, 1985, abandoned. This application Feb. 17, 1987, Ser. No. 19,682
Claims priority, application Japan, Nov. 2, 1984, 59-231711; Mar. 28, 1985, 60-64423
Int. Cl.[4] H01L 29/48
U.S. Cl. 357—15 6 Claims



1. A field effect transistor comprising:

a semi-insulative substrate;

a gate layer formed on said substrate and made of a conductive material forming a Schottky junction between said substrate and said gate layer;

source and drain regions formed in said substrate to have a first conductivity type;

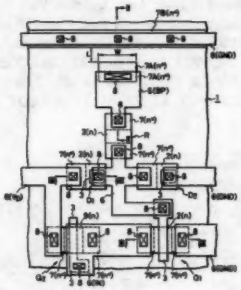
a semiconductor active layer formed in a surface portion of said substrate in a manner so as to be in contact with said source and drain regions at first and second end portions, respectively, thereof to serve as a channel of said transistor; and

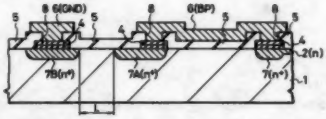
barrier layer means formed in said substrate to have a second conductivity type and to be in contact with an entire bottom portion of said active layer and at least said drain region, for forming therein an impurity concentration gradient under said active layer and said drain layer such that the impurity concentration of said barrier layer means under the second end portion of said active layer is higher than that under a middle portion of said active layer and that under said drain region, for suppressing current leakage from at least said drain region to said substrate, and for suppressing a depletion layer from over-expanding in a middle portion of said active layer due to a junction between said channel and said barrier layer means, to thereby improve a current drivability of said transistor.

4,803,527
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING SEMI-INSULATOR SUBSTRATE

Yasushi Hatta, Tokyo; Kazumichi Mitsusada, Kodaira; Hirotoshi Tanaka, Yamanashi, and Takehisa Hayashi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,466
Claims priority, application Japan, Jun. 21, 1985, 60-134019
Int. Cl.[4] H01L 29/90, 29/78
U.S. Cl. 357—13 7 Claims





1. A semiconductor device formed in a semi-insulator substrate comprising:

an internal circuit including a MESFET formed in said semi-insulator substrate;

an electrostatic destruction protect circuit formed in said semi-insulator substrate;

external terminals formed over said semi-insulator substrate;

a first semiconductor region of a first conductivity type formed in said semi-insulator substrate and connected to said external terminals; and

a second semiconductor region of the first conductivity type formed in said semi-insulator substrate and receiving a

predetermined fixed potential, said second semiconductor region being formed as one continuous region along a periphery of said semi-insulator substrate and formed apart from said first semiconductor region with a predetermined distance so that said first and second semiconductor regions form a protection means for said MESFET and said electrostatic destruction protect circuit,

wherein said MESFET formed in said semi-insulator substrate in said internal circuit comprises source and drain regions of the first conductivity type, a channel region and a Schottky gate electrode formed on said channel region, said channel region being shallower than said source and drain regions and having a lower impurity concentration than said source and drain regions,

wherein said electrostatic destruction protect circuit is connected to said external terminals and includes a resistance element having one of the ends thereof connected to said external terminal with the other end being connected to said Schottky gate electrode of said internal circuit, and

wherein said first semiconductor region includes said resistance element of said electrostaic destruction protect circuit.

4,803,528

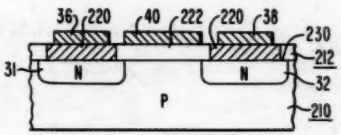
INSULATING FILM HAVING ELECTRICALLY CONDUCTING PORTIONS

Jacques I. Pankove, Princeton, N.J., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 172,757, Jul. 28, 1980, Pat. No. 4,339,285. This application May 20, 1982, Ser. No. 380,284

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.1 **1 Claim**



1. A selectively electrically conducting structure comprising:

a layer of oxygenated, doped, non-single crystalline silicon film;

a semiconductor substrate having a surface, the substrate including spaced source and drain regions of an insulated gate field effect device at said surface;

the layer of oxygenated, doped, non-single crystalline silicon film is disposed on said surface and selectively laser irradiated so as to form substantially conducting irradiated portions disposed over the source and drain regions, and a substantially insulating non-irradiated portion disposed on the substrate surface between the source and drain regions;

source and drain electrodes disposed respectively on the conducting portions of the silicon film disposed on the source and drain regions; and

a gate electrode disposed over the insulating portion of the silicon film so as to form an insulated gate.

4,803,529

ELECTRICALLY ERASABLE AND ELECTRICALLY PROGRAMMABLE READ ONLY MEMORY

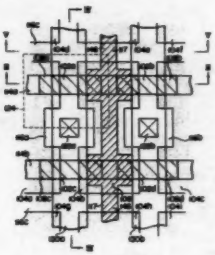
Fujio Masuoka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 13, 1981, Ser. No. 321,322

Claims priority, application Japan, Nov. 20, 1980, 55-163931; Nov. 20, 1980, 55-163932; Nov. 20, 1980, 55-163933; Nov. 29, 1980, 55-168616; Nov. 29, 1980, 55-168617; Nov. 29, 1980, 55-168618; Nov. 29, 1980, 55-168619; Nov. 29, 1980, 55-168620; Dec. 20, 1980, 55-180951; Jan. 21, 1981, 56-7558; Jul. 30, 1981, 56-119782

Int. Cl.[4] H01L *29/78, 27/02*; G11C *11/40*

U.S. Cl. 357—23.5 **29 Claims**



1. A semiconductor memory device with a plurality of memory cells arranged in a matrix form, each of said memory cells comprising:

a semiconductor region of a first conductivity type;

source and drain regions of a second conductivity type formed in said semiconductor region;

a gate insulation film formed on a part of said semiconductor region between said source and drain regions;

a field insulation film, formed on said semiconductor region, for separating each memory cell from the other memory cells;

an erase gate formed over said field insulation film;

a floating gate formed on said gate insulation film and extending over said field insulation film, a portion of said floating gate, which is formed over said field insulation film, overlapping a part of said erase gate, said floating gate being arranged symmetrically about said erase gate, and said erase gate of one of said memory cells being commonly formed for a plurality of said memory cells, floating gate;

a first insulating film interposed between said floating gate and said erase gate;

a control gate formed over said floating gate and said erase gate;

a second insulating film interposed between said control gate and said floating gate; and

a third insulating film interposed between said control gate and said erase gate;

whereby said control gate is insulated from said erase gate and said floating gate, and

wherein said portion of said floating gate overlapping said part of said erase gate is provided between said field insulation film and said control gate.

4,803,530

SEMICONDUCTOR INTEGRATED CIRCUIT FORMED ON AN INSULATOR SUBSTRATE

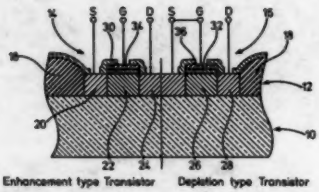
Shinji Taguchi, and Hiroyuki Tango, both of c/o Toshiba Research & Development Center, Toshiba-cho No. 1, Komukai, Saiwai-ku, Kawasaki-shi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 615,703, May 29, 1984, abandoned, which is a continuation of Ser. No. 934,493, Aug. 17, 1978, abandoned. This application Feb. 19, 1986, Ser. No. 830,868

Claims priority, application Japan, Aug. 22, 1977, 52-99549

Int. Cl.[4] H01L *27/12, 29/78*

U.S. Cl. 357—23.7 1 Claim



1. A semiconductor integrated circuit with temperature compensation, comprising

an enhancement-depletion semiconductor integrated circuit containing a silicon on sapphire substrate including a drive transistor of an enhancement type and a load transistor of a depletion type,

said depletion type load transistor including a channel region having a layer of insulator material thereon, thereby to define an insulated gate depletion mode transistor,

said depletion mode channel region having a donor concentration N_D in the range of 2×10^{13}–$3.6\times10^{15}/cm^3$ and said depletion mode gate insulator having a surface charge Q_{ss} that has a substantially constant value of about 8×10^{-9} coulomb/cm^2-eV at a temperature of about 20° C.,

said depletion type load transistor having a threshold voltage between −2.1V and −1.7V when the ambient temperature of said circuit is in the range of −60° C. to 60° C., and

said circuit having a variation rate of delay time t_{pd} and power consumption P_d at a substantially constant value within about 10%, thereby significantly reducing temperature dependency of the delay time and power consumption.

4,803,531

IMAGING CHARGE-COUPLED DEVICE HAVING AN ALL PARALLEL OUTPUT

Larry D. Riley, Beaverton, and Denis L. Heidtmann, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 18, 1987, Ser. No. 98,574

Int. Cl.[4] H01L *29/78;* G11C *19/28*

U.S. Cl. 357—24 4 Claims

1. A charge-coupled device comprising:

a substrate of semiconductor material having at least first and second buried channels formed therein,

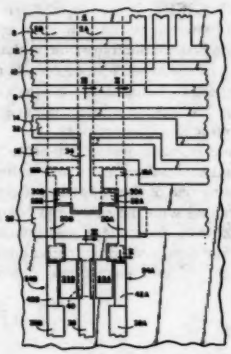
at least two sets of clock electrodes overlying both the first and second buried channels, so that by application of predetermined potential levels to the clock electrodes, electrical charge may be propagated in controlled fashion along each of the buried channels towards an output end thereof,

a floating diffusion at the output end of each buried channel for receiving charge propagated along the channel,

output transistors associated with the buried channels respectively and each having a control electrode connected to the floating diffusion of the associated buried channel,

an output diffusion formed in the substrate at a location between the floating diffusions of the channels and the control electrodes of the transistors and extending transversely of the channels,

a reset gate associated with each channel and lying over the substrate between the floating diffusion of the associated channel and the output diffusion, so that by application of a predetermined potential to the reset gate a conductive



channel is formed in the substrate between the floating diffusion and the output diffusion, and

a reset bus extending over the substrate on the opposite side of the floating diffusions from the reset gate, the reset bus having a bus extension which extends over the substrate between the floating diffusions and is connected to the reset gates.

4,803,532

VERTICAL MOSFET HAVING A PROOF STRUCTURE AGAINST PUNCTURE DUE TO BREAKDOWN

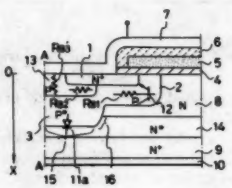
Teruyoshi Mihara, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Division of Ser. No. 767,628, Aug. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 865,598, May 22, 1986, Pat. No. 4,686,551, which is a continuation of Ser. No. 555,050, Nov. 25, 1983, abandoned. This application Feb. 25, 1987, Ser. No. 18,867

Claims priority, application Japan, Nov. 27, 1982, 57-208293; Aug. 24, 1984, 59-176038

Int. Cl.[4] H01L *29/78, 29/06, 27/02*

U.S. Cl. 357—234 7 Claims



1. An MOS transistor comprising:

a drain region having a low resistivity region of a first conductivity type, a redistributed region of said first conductivity type above said low resistivity region, and a high resistivity region of the first conductivity type above said redistributed region;

a well region of a second conductivity type having a first well portion with a curved section in contact with said high resistivity region and having a second well portion, said second well portion and being narrower than said first

well portion, said second well portion extending below said first well portion into contact with said redistributed region;

a channel region of the second conductivity type contained in said first well portion;

a source region of the first conductivity type adjacent to the channel region of said well region;

a gate electrode formed above the channel region on an insulator layer;

a source electrode formed in contact with the source region and in contact with the upper surface of the second well portion of the well region, and

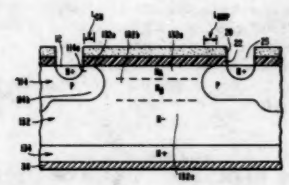
a drain electrode formed on the bottom surface of the low resistivity region.

4,803,533

IGT AND MOSFET DEVICES HAVING REDUCED CHANNEL WIDTH

Mike F. Chang, Cary; Hamza Yilmaz, Raleigh; George L. Gaufreau, Cary, and King Owyang, Carboro, all of N.C., assignors to General Electric Company, Fairfield, Conn.

Filed Sep. 30, 1986, Ser. No. 913,785
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.4 **6 Claims**



1. An insulated gate device, comprising:

a substrate having a major top surface;

a drain region having a vertical portion that extends to the top surface;

first and second channel-forming well portions projecting into the substrate from the top surface to a first predetermined depth, the first and second channel-forming well portions being contiguous with the drain region and being laterally spaced by the vertical portion of the drain region;

the drain region including at least three layers: (a) an upper layer of the vertical portion, that includes a relatively slow-diffusing dopant and extends to a second predetermined depth, the second predetermined depth being shallower than said first predetermined depth; (b) a lower layer of the vertical portion, that includes a relatively fast diffusing dopant and extends from said second predetermined depth to said first predetermined depth; and (c) a background layer, extending beneath said first predetermined depth;

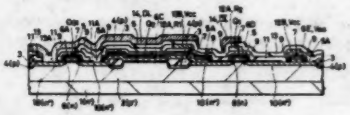
the upper layer of the vertical portion being more heavily doped than the lower layer of the vertical portion and the lower layer of the vertical portion being more heavily doped than the background layer, such that the spacing between the first and second channel-forming well portions is greater between the top substrate surface and the second predetermined depth than it is between the second predetermined depth and the first predetermined depth.

4,803,534

SEMICONDUCTOR DEVICE SRAM TO PREVENT OUT-DIFFUSION

Atsuyoshi Koike, Kokubunji; Shuji Ikeda, Koganei, and Koichi Nagasawa, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,674
Claims priority, application Japan, Jun. 21, 1985, 60-134018
Int. Cl.[4] H01L 23/48
U.S. Cl. 357—71 **24 Claims**



1. A semiconductor device comprising:

a first conductor layer comprised of one of a refractory metal film and a refractory metal silicide film provided on an upper side of a polycrystalline silicon film into which is diffused an impurity for lowering the resistance thereat;

a stopper layer provided on the upper side of said first conductor layer and being disposed over and having the same pattern shape as said first conductor layer;

an insulator film formed overlying said first conductor layer and said stopper layer;

a contact hole formed through a portion of said insulator film above said first conductor layer; and

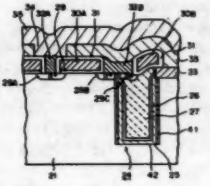
a second conductor layer comprised of a polycrystalline silicon film provided on the upper side of said insulator film and electrically connected to said first conductor layer through said contact hole and said stopper layer; said stopper layer being such that is inhibits the impurity contained in said first conductor layer from being diffused into said second conductor layer.

4,803,535

DYNAMIC RANDOM ACCESS MEMORY TRENCH CAPACITOR

Masao Taguchi, Sagamihara, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 2, 1987, Ser. No. 20,983
Claims priority, application Japan, Mar. 3, 1986, 61-045823; Mar. 3, 1986, 61-045824; Mar. 14, 1986, 61-057309
Int. Cl.[4] H01L 29/78, 49/02, 27/02
U.S. Cl. 357—23.6 **8 Claims**



1. A dynamic random access memory having a trench capacitor, comprising:

a semiconductor substrate;

a trench formed in said semiconductor substrate;

an insulating layer formed on an inner surface of said trench and having an opening at a bottom of said trench;

a first conductive layer formed at the opening and on said insulating layer, said first conductive layer being ohmically connected to said semiconductor substrate at said

opening, an upper end of said first conductive layer being located lower than a top level of said trench for preventing said first conductive layer from being exposed outside said trench;

a dielectric layer formed on said first conductive layer;

a second conductive layer formed on said dielectric layer so as to fill said trench,

a said first conductive layer, said dielectric layer, and said second conductive layer constituting a charge storage capacitor; and

a MIS transistor formed in said semiconductor substrate,

wherein said second conductive layer is ohmically connected to a source or drain region of said MIS transistor.

4,803,536

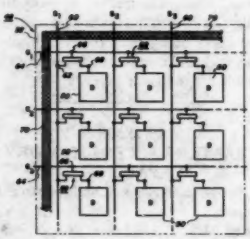
ELECTROSTATIC DISCHARGE PROTECTION NETWORK FOR LARGE AREA TRANSDUCER ARRAYS

Hsing C. Tuan, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1986, Ser. No. 922,603

Int. Cl.[4] H01L *45/00, 27/12, 29/78*

U.S. Cl. 357—23.13 **3 Claims**



1. An electrostatic discharge protection network for a large area transducer array, said array including a substrate on which is formed a plurality of thin film transducer elements and a thin film addressing circuit associated with each transducer element for changing the state of said transducer element, each of said addressing circuits including at least one thin film amorphous silicon transistor having a source terminal electrode and a drain terminal electrode spaced from one another and contiguous to a semiconductor layer, a gate electrode spaced from said semiconductor layer by a gate dielectric layer and located so as to control the current flow from said source terminal electrode to said drain terminal electrode, through said semiconductor layer, and a plurality of input contact pads for receiving external signals, connected to said addressing circuit, for controlling the state of said transducer elements said protection network including

a strip of n+ amorphous silicon resistive material extending across all of said input contact pads, and

resistor means comprising inter contact pad portions of said stripe of resistive material for providing current leakage paths to equalize the potential across all of said gate dielectrics during an electrostatic discharge and wherein said resistor means as connected to said circuits and functioning to provide current leakage paths does not affect the normal operation of said thin film transistors.

4,803,537

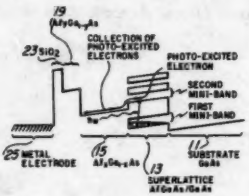
INFRARED DETECTOR SYSTEM BASED UPON GROUP III-V EPITAXIAL MATERIAL

Adam J. Lewis, and William R. Frensley, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 926,814, Oct. 31, 1986, abandoned, which is a continuation of Ser. No. 570,463, Jan. 13, 1984, abandoned. This application Mar. 14, 1988, Ser. No. 170,604

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **6 Claims**



1. A semiconductor detector for infrared radiation, comprising:

(a) an absorption superlattice with first and second mini-bands, said mini-bands separated by an energy about equal to the energy of the photons of a frequency of infrared radiation to be detected, said superlattice with carriers in said first mini-band but not in said second mini-band;

(b) a collector abutting said superlattice, said collector with energy band edge between said mini-bands at said superlattice so carriers in said first mini-band are blocked from said collector but carriers photo-excited by said infrared radiation from said first mini-band to said second mini-band can pass into said collector; and

(c) a sensor coupled to said collector to detect carriers in said collector.

4,803,538

THYRISTOR WITH ADJUSTABLE BASE-TO-EMITTER RESISTANCE

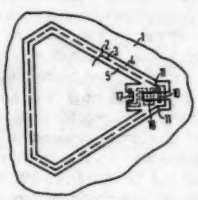
Peter Voss, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 4, 1987, Ser. No. 21,473

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1986, 3607256

Int. Cl.[4] H01C *29/74*

U.S. Cl. 357—38 **3 Claims**



1. Thyristor having a semiconductor body with an emitter zone and a base zone formed thereon, an emitter electrode seated on the emitter zone, and a base electrode seated on the base zone, the emitter electrode being formed with a recess, comprising a base-emitter p-n junction disposed within the recess and adjoining a surface of the semiconductor body, a gate electrode seated on the base zone, an ohmic resistance integrated in the semiconductor body between the emitter electrode and said gate electrode, said p-n junction being locally bridged by one of said gate and emitter electrodes, said

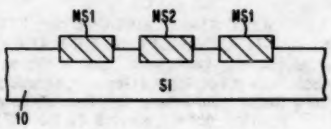
ohmic resistance having a value adjustable in accordance with a removal of a part of at least one of said gate and emitter electrodes, said p-n junction being locally bridged by the emitter electrode, and said ohmic resistance being formed by the base zone, the base zone having a finger projecting into the emitter zone, and a metal bridge connected to the emitter electrode and contacted by said finger, said gate electrode being formed with a recess at the periphery thereof, said metal bridge projecting into said last-mentioned recess.

4,803,539

DOPANT CONTROL OF METAL SILICIDE FORMATION

Peter A. Psaras, Ossining; King-Ning Tu, Chappaqua, and Richard D Thompson, Lake Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1985, Ser. No. 717,984
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—67 23 Claims



1. A metal silicide-silicon structure including thermally formed metal silicides including the same metal and having first and second compound phases in first and second regions of said structure, comprising:

a substrate having a first region thereof which is doped with a selected dopant to a level sufficient to cause said first region to affect the compound phase of a metal silicide thermally formed thereon,

said substrate including a second region that is either undoped or doped with an impurity incapable of affecting the comound phase of a metal silicide formed thereon or doped with an impurity capable of affecting said phase in an amount sufficiently low that said phase is unaffected,

a metal silicide thermally formed on said first and second regions and including the same metal in said first and second regions, the compound phase of said metal silicide in said first region being different than the compound phase of said metal silicide formed in said second region.

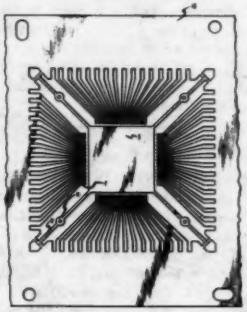
4,803,540

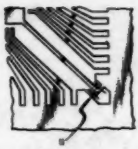
SEMICONDUCTOR INTEGRATED CIRCUIT PACKAGES

Harold W. Moyer, South Whitehall Township, Lehigh County, and Harry R. Scholz, Lower Macungie Township, Lehigh County, both of Pa., assignors to American Telephone and Telegraph Co., AT&T Bell Labs, Murray Hill, N.J.

Filed Nov. 24, 1986, Ser. No. 934,062
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—70 5 Claims

1. A semiconductor integrated circuit package comprising: a semiconductor integrated circuit chip; a lead frame, said lead frame having a paddle on which said chip is mounted and paddle support arms; and an external mounting frame having a plurality of fingers, electrical connections from said chip to said fingers, said paddle being connected to said external mounting frame by said paddle support arms CHARACTERIZED IN THAT said paddle support arms comprise a deformation absorbing member, said paddle being depressed with respect to said external mounting frame, said deformation





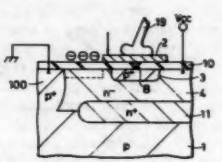
absorbing member localizing deformation during paddle downsetting and maintaining desired physical characteristics.

4,803,541

SEMICONDUCTOR DEVICE

Toyomasa Kouda, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 728,201, Apr. 29, 1985. This application Apr. 4, 1988, Ser. No. 178,847
Claims priority, application Japan, May 23, 1984, 59-102567
Int. Cl.[4] H01L *29/78, 29/90, 29/40, 23/48*
U.S. Cl. 357—68 24 Claims



1. A semiconductor device comprising:

(1) an island region of a first type of conductivity selectively formed on a semiconductor substrate of a second conductivity type opposite to the first conductivity type, the island region being electrically connected to a power source;

(2) a semiconductor region of the second type of conductivity formed in said island region, said semiconductor region being electrically separated from said semiconductor substrate;

(3) an insulating film formed on surfaces of said semiconductor region, said island region and said semiconductor substrate;

(4) a bonding pad formed on a portion of said insulating film located over said semiconductor region so that said bond-

ing pad is electrically separated from said semiconductor region; and

(5) a bonding wire connected to said bonding pad;

wherein said semiconductor region of the second type of conductivity, in plan view, is located, in its entirety, inside of the periphery of the bonding pad that exists over said semiconductor region of the second type of conductivity, so that, in plan view, the entire periphery of the semiconductor region is spaced from, and inside of, the entire periphery of the bonding pad.

4,803,542

CARRIER ELEMENT FOR AN IC-MODULE

Yahya Haghiri-Tehrani, and Joachim Hoppe, both of Munich, Fed. Rep. of Germany, assignors to Gao Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

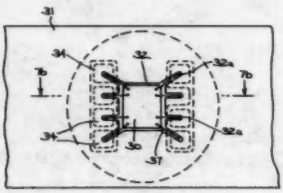
Continuation of Ser. No. 649,159, Sep. 10, 1984, which is a continuation of Ser. No. 288,384, Jul. 31, 1981. This application May 18, 1987, Ser. No. 51,850

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3029667

The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.

Int. Cl.[4] H01L *23/30, 23/14, 23/48*

U.S. Cl. 357—72 **3 Claims**



1. A carrier element for an IC-chip suitable for incorporation, as a unit, into a financial or identification card, said carrier element comprising:

a single layer carrier stratum having an aperture with a periphery, said carrier stratum further having recesses outside the periphery of said aperture through said stratum;

an electrically conductive film laminated to said carrier stratum and spanning said recesses;

contact surfaces formed out of said electrically conductive film but electrically isolated therefrom, said contact surface lying outside the periphery of said aperture and accessible through said recesses;

an IC-chip positioned in the aperture of said carrier stratum;

connection means in said recesses for connecting said IC-chip to said contact surfaces, said connection means being unsupported by said carrier stratum; and

a hardened resin filling said aperture and recesses, said resin surrounding said IC-chip in said aperture and said connection means in said recesses.

4,803,543

SEMICONDUCTOR DEVICE AND PROCESS FOR PRODUCING THE SAME

Hideo Inayoshi, Kokubunji; Akira Suzuki, Ome; Kunihiro Tsubosaki, Hino; Toyoichi Ueda, Katsuta; Daisuke Makino; Nobuo Ichimura, both of Hitachi, and Kazunari Suzuki, Tokyo, all of Japan, assignors to Hitachi, Ltd.; Hitachi Chemical Co. and Hitachi Microcomputer Engineering Ltd., all of Tokyo, Japan

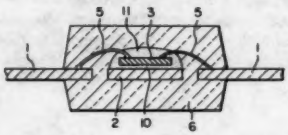
Filed Dec. 4, 1981, Ser. No. 327,554

Claims priority, application Japan, Dec. 10, 1980, 55-173287

Int. Cl.[4] H01L *23/28, 39/02*

U.S. Cl. 357—72 **22 Claims**

1. A semiconductor device comprising a semiconductor element, the back main face of which is fixed to a supporting member with an adhesive layer formed by heat-curing an adhesive composition to bond the semiconductor element through its back main face to the supporting member, the adhesive composition comprising an epoxy resin, a novolak-



type phenolic resin as a hardener, a solvent capable of dissolving both of said resins, and powdered silver, said adhesive layer being positioned between the back main face and the supporting member.

4,803,544

PREFABRICATED STRIP CONDUCTOR NETWORK ASSEMBLY UNIT AND PROCESS FOR MAKING SAME

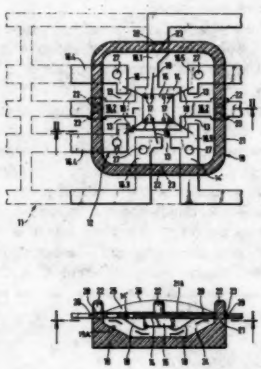
Wolfgang Holzschuh, Lauterbach, and Wolfgang Ganter, Schramberg, both of Fed. Rep. of Germany, assignors to Junghans Uhren GmbH, Schramberg, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,303

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623419

Int. Cl.[4] H01L *23/28, 23/02, 23/48*

U.S. Cl. 357—72 **4 Claims**



1. A strip conductor network module adapted to be installed in a circuit board of an electromechanical clock movement, said module comprising:

a strip conductor network defining first and second sides and having gaps disposed between selected strip conductors thereof, at least some of said strip conductors including through-holes,

a circuit chip mounted on said first side of said network, and bond wiring connecting said circuit chip with said network,

only one of said sides of said network being overlain by a protective cap, said one side comprising said first side, said protective cap including:

a plurality of pins frictionally mounted in said holes, and

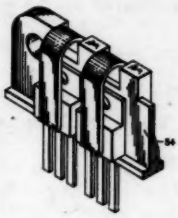
an inner surface spaced from said chip to form a closed cavity therearound, said cavity being filled with a hardenable plastic mass encasing said chip and said wiring.

4,803,545

SELF-FIXTURING HEAT SINK

Alan D. Birkle, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 17, 1988, Ser. No. 169,549
Int. Cl.[4] H01L 23/02
U.S. Cl. 357—81 4 Claims



1. A heat sink for a plurality of transistors that are to be held on the heat sink by two-legged clips, comprising:

an elongated base member having a front side, a back side, and top and bottom edges, the front side having a substantially flat surface on which each transistor is to be held in place, at a pre-selected transistor site, by one leg of a clip, the back side of the base member being adapted to receive a plurality of clip legs at a corresponding plurality of clip-leg sites, each such clip leg site being positioned directly opposite a transistor site on the front side for receiving the other leg of the same clip that holds a transistor at said opposite transistor site;

a ledge formed on the front side of the base member, the ledge running substantially parallel to the bottom edge of the base member to form a stop for transistors situated at the transistor sites; and

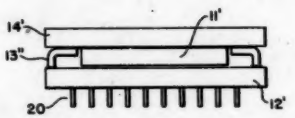
a clip-stop for each clip-leg site, each clip-stop being formed on the back side by a flat surface extending substantially parallel to the bottom edge of the base member.

4,803,546

HEATSINK PACKAGE FOR FLIP-CHIP IC

Masahiro Sugimoto, Yokosuka, and Yasumasa Wakasugi, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 76,762, Jul. 23, 1987, Pat. No. 4,742,024, which is a division of Ser. No. 937,414, Dec. 3, 1986, Pat. No. 4,698,663. This application Feb. 9, 1988, Ser. No. 154,046
Int. Cl.[4] H01L 23/12, 23/36
U.S. Cl. 357—81 1 Claim



1. A semiconductor device comprising:

a substrate having a top surface;

at least one wiring layer formed on the top surface of said substrate;

a semiconductor element having a top face mounted on the top surface of said substrate and electrically coupled to said wiring layer, having a bottom face and having side faces;

a cap having an external shape substantially the same size as that of said substrate and a convex shape in the cross section thereof, a peripheral portion of said cap being adhered to a peripheral portion of the top surface of said substrate and surrounding the side faces of said semiconductor element, said cap having a flat portion parallel to said substrate at a top portion of the convex shape and having an opening in the flat portion, which is smaller than said substrate, the opening exposing substantially the entire bottom face of said semiconductor element; and

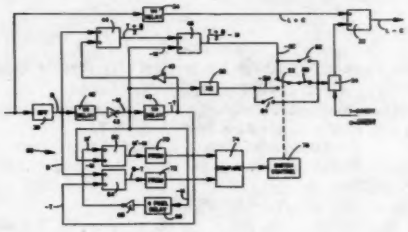
a heatsink mounted on the flat portion of said cap and on the exposed bottom face of said semiconductor element so as to be supported by said cap and said semiconductor element, said heatsink having an external shape substantially the same size as that of said substrate.

4,803,547

ADAPTIVE COMB FILTERING SYSTEM FOR PROCESSING VIDEO SIGNALS

Boyd L. Stratton, Woodside, Calif., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 10, 1987, Ser. No. 36,851
Int. Cl.[4] H04N 9/78
U.S. Cl. 358—31 10 Claims



1. An adaptive comb filtering system for use in separating luminance and chrominance components of a composite video signal which includes a plurality of successive scan lines comprising:

means for receiving said composite video signal and separating said video signal into a middle (M) scan line component and vertically adjacent top (T) and bottom (B) scan line components;

means responsive to said middle, top and bottom scan line components for deriving a combed chroma signal therefrom;

means for deriving from one of said scan line components an uncombed chroma signal; and

signal selection control means for selecting as a chrominance output signal either said combed chroma signal or said uncombed chroma signal in dependence upon the relative relationship of any vertical transition of two of said scan line components to any horizontal transition of one of said scan line components.

4,803,548

COLOR VIDEO IMAGE ENHANCEMENT

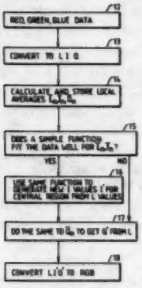
Richard A. Kirk, Herts, England, assignor to Crosfield Electronics Limited, London, England

Filed Dec. 1, 1987, Ser. No. 127,144
Claims priority, application United Kingdom, Jan. 12, 1987, 8700565
Int. Cl.[4] H04N 9/64
U.S. Cl. 358—36 7 Claims

1. A method of enhancing a video image defined by luminance information and chromaticity information representing said image as a plurality of regions, the method comprising for each of a number of said selected regions of the image

(a) determining a statistical relationship between said luminance information and said chromaticity information for the selected region; and,

(b) generating modified chromaticity information for at least a portion of said selected region by applying said determined statistical relationship to said luminance information for the said portion.


RED, GREEN, BLUE DATA
CONVERT TO L I Q
CALCULATE AND STORE LOCAL AVERAGES
DOES A SIMPLE FUNCTION FIT THE DATA WELL FOR
YES
NO
USE SAME FUNCTION TO
CENTRAL REGION FROM L VALUES
DO THE SAME TO
CONVERT L I Q TO RGB

4,803,549

LOW-PASS FILTER FOR LIMITING THE FREQUENCY BAND OF A LUMINANCE SIGNAL

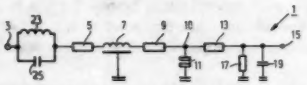
Karl-Heinz O. Kupfer, Krefeld, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,401

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1985, 3523753

Int. Cl.[4] H03H 7/01

U.S. Cl. 358—39 **8 Claims**



1. A low-pass filter for limiting the frequency band of a luminance signal, in particular the luminance signal in the recording channel of a video recording apparatus, comprising an input terminal and an output terminal, a signal path extending between said input and output terminals, a delay line coupled in said signal path, a ceramic filter connected to said signal path and to a point of constant potential to attenuate signal components above a cut-off frequency, and a 5.5 MHz attenuating filter connected in said signal path at a location before the connection of said ceramic filter.

4,803,550

IMAGING APPARATUS HAVING ILLUMINATION MEANS

Hisao Yabe, Hachioji; Kenji Kimura, Tachikawa; Masahide Kanno, Hachioji; Kiyoshi Tsuji, Tama; Jun Yoshinaga, Hino; Takeshi Yokoi; Kazuhiko Ozeki, both of Hachioji; Shinichi Nishigaki, Tokyo; Takeaki Nakamura, Hino; Yoshikazu Tojo, Hachioji, and Hiromasa Suzuki, Akishima, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,133

Claims priority, application Japan, Apr. 17, 1987, 62-94448; May 8, 1987, 62-112004; Oct. 7, 1987, 62-254068

Int. Cl.[4] A61B 1/04, 1/06

U.S. Cl. 358—98 **13 Claims**

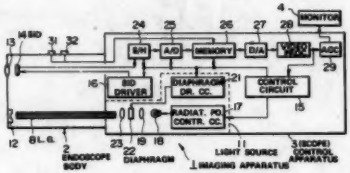
1. An imaging apparatus comprising:

illumination means including a light source lamp for generating illumination light, mechanical transmissive light quantity restricting means disposed at a forward position on an optical path of said light source lamp and adapted to restrict a quantity of transmissive light of said illumination light, and lamp radiation controlling means for controlling the radiation of said light source lamp;

imaging means formed by using a solid-state imaging device;

solid-state device driving means for outputting a drive signal so as to read a signal photoelectrically converted by said solid-state imaging device;

signal processing means for generating a video signal of a predetermined system with respect to a signal read by said solid-state imaging device upon application of said drive signal thereto;



imaging controlling means for substantially inhibiting imaging by said solid-state imaging device during a transient period of time until said transmissive light quantity restricting means reaches a predetermined amount of opening; and

means for controlling said transmissive light quantity controlling means which is adapted to decrease an amount of opening of said transmissive light quantity controlling means in a predetermined imaging period after a time when said transmissive light quantity controlling means has reached said predetermined amount of opening.

4,803,551

MODULE FOR USE IN RECEIVING TELETEXT SIGNAL

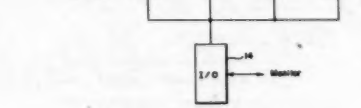
Chong S. Park, Kyungkeedo, Rep. of Korea, assignor to Gold Star Co. Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 813,716, Dec. 27, 1985, abandoned. This application Feb. 1, 1988, Ser. No. 150,503

Claims priority, application Rep. of Korea, Dec. 31, 1984, 1984-9574

Int. Cl.[4] H04N 7/04

U.S. Cl. 358—147 **2 Claims**



1. A module for receiving teletext data contained in a composite video signal, for use with a personal computer or a videotex decoder system, comprising:

data selector means for separating said teletext data from said composite video signal;

data receiver means for receiving said teletext data from said data selector means, checking said teletext data for the existence of errors, comparing an address of said teletext data with a preselected address stored in said data receiver means, and outputting teletext data with an address corresponding to said preselected address;

processing means for processing said teletext data outputted by said data receiver means; and

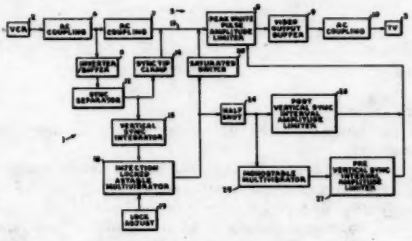
input/output interface means, connectable to said personal computer or said videotex system, for outputting said processed teletext data for display by said personal computer or videotex system, and for inputting said preselected address to said data receiver means from a keyboard of said personal computer or said videotex system.

4,803,552

VERTICAL BLANKING INTERVAL STANDARDIZER CIRCUIT

Roger A. Marin, Portland, Oreg., assignor to Xantech Corporation, Sylmar, Calif.

Filed Dec. 3, 1986, Ser. No. 937,494
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—148 10 Claims



7. A vertical blanking interval standardizer circuit comprising:

(a) limiter amplifier means having a video signal passing from an input to an output thereof, said limiter amplifier means being biasable to a cutoff state;

(b) timing means operatively detecting the occurrence of a vertical blanking interval of said video signal and generating a timing signal indicative of said vertical blanking interval; and

(c) limiter control circuit means connected between said amplifier means and said timing means, said control circuit means, in response to said timing signal, biasing said amplifier means to be cutoff by a video signal level occurring in said video signal during said vertical blanking interval which exceeds a selected blanking level and limiting the output level of said amplifier means to said selected blanking level;

(d) said video signal including a vertical sync interval occurring during said vertical blanking interval and wherein;

(e) said timing means including early timing means generating an early timing signal indicating an early portion of said vertical blanking interval beginning substantially at the beginning of said vertical blanking interval and extending until at least the beginning of said vertical sync interval;

(f) said timing means including late timing means generating a late timing signal indicating a late portion of said vertical blanking interval beginning at the end of said vertical sync interval and extending until the end of said vertical blanking interval;

(g) said limiter control circuit means including early limiter control circuit means cooperating with said early timing means to limit the output of said amplifier means during the occurrence of a pulse having a level which exceeds said selected blanking level; and

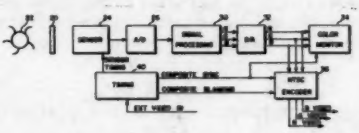
(h) said limiter control circuit means including late limiter control circuit means cooperating with said late timing means to limit the output of said amplifier means during the occurrence of a pulse having a level which exceeds said selected blanking level.

4,803,553

VIDEO TIMING SYSTEM WHICH HAS SIGNAL DELAY COMPENSATION AND WHICH IS RESPONSIVE TO EXTERNAL SYNCHRONIZATION

Anthony W. Schrock, Rochester, and David K. McCauley, Henrietta, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 11, 1988, Ser. No. 143,110
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—149 8 Claims



7. Apparatus for generating a video signal, the apparatus comprising:

a. means, responsive to an image, for outputting at a first time a first signal which begins with data representing a first element of an image;

b. means for receiving the first signal at a time which is later than the first time by a first time differential, and for generating an internal video signal for displaying the image by a raster;

c. timing means including

(1) first means for adjusting the internal video signal generating means so that the internal video signal begins the raster at a second time in response to receipt of an external synchronizing signal, and at a third time in response to nonreceipt of the external synchronizing signal.

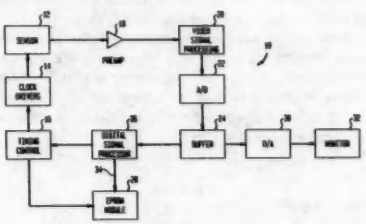
(2) second means for adjusting the first signal outputting means in a manner to begin outputting the first element ahead of the raster by a time which is equal to the time differential, so that the raster begins with the first element of the image when the raster starts at the second time and at the third time.

4,803,554

ELECTRONIC IMAGING CAMERA UTILIZING EPROM MEMORY

David D. Pape, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 30, 1987, Ser. No. 102,859
Int. Cl.[4] H04N 5/225
U.S. Cl. 358—209 16 Claims



9. A process for electronically sensing and storing a still image comprising the steps of:

sensing scene light with a predetermined number of discrete image sensing elements and providing an analog information signal corresponding to the intensity of illumination incident to each of the discrete image sensing elements;

converting the analog electronic information signals to digital electronic information signals so that a separate and

distinct digital electronic information signal comprising a plurality of binary bits corresponds to the intensity of illumination incident to each of the image sensing elements;

temporarily storing the digital electronic information signals; and

finally storing the digital electronic information signals which define each still image in a select one of a plurality of different groups of electronically programmable read only memories (EPROM's) in a manner whereby a different plurality of the binary bits of the digital electronic information signals are simultaneously stored in respective ones of the EPROM's in the selected group.

4,803,555

METHOD OF DRIVING A SOLID STATE IMAGE PICKUP DEVICE

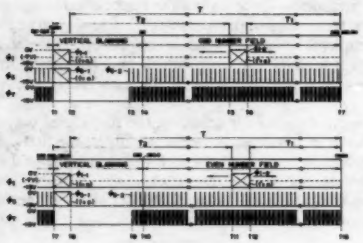
Kenichi Shinbori, and Kazuo Ishikawa, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 903,828, Sep. 3, 1986, abandoned, which is a continuation of Ser. No. 843,829, Mar. 26, 1986, abandoned, which is a continuation of Ser. No. 596,404, Apr. 3, 1984, abandoned. This application Aug. 24, 1987, Ser. No. 89,045

Claims priority, application Japan, Apr. 6, 1983, 58-61098

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.19 **55 Claims**



1. A method of driving a solid-state image pickup device of the frame transfer type having an image sensing part, a storage part, and a readout part, said method comprising:

(a) a first step of periodically transferring an image charge signal in the image sensing part to the storage part during a first time interval;

(b) a second step of periodically reading out the image charge signal from the storage part one line by one through the readout part each during a second time interval shorter than said first time interval; and

(c) a third step of transferring the image charge signal in the image sensing part one line by one to the storage part during a third time interval shorter than said second time interval within said first time interval, wherein said first time interval corresponds to the field time interval of a standard television signal.

4,803,556

SCAN LAMP INTENSITY CONTROL FOR RASTER INPUT SCANNERS

Thomas R. Belkirch, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 15, 1987, Ser. No. 61,628

Int. Cl.[4] H04N *5/238, 1/10*

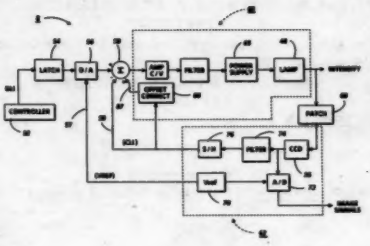
U.S. Cl. 358—228 **13 Claims**

1. A method of operating a raster input scanner having at least one linear array of photosensors for scanning an image line by line and generating analog image signals representative of the image line scanned, at least one lamp for illuminating the image for scanning by said array, and an adjustable power supply for operating said lamp, comprising the steps of:

(a) with each line scanned, additionally scanning an area of predetermined reflectance to provide reflectance signals with said image signals;

(b) separating the reflectance signals from said image signals;

(c) deriving a first signal representing current lamp intensity from said reflectance signals;



(d) providing a second signal representing desired lamp intensity;

(e) comparing at least said first and second signals with one another to provide an error signal; and

(f) adjusting said power supply in response to said error signal to control the illumination intensity of said lamp and provide said desired lamp intensity when scanning.

4,803,557

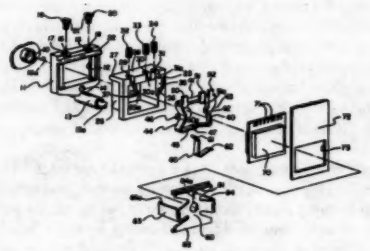
ADJUSTABLE MOUNT FOR IMAGE SENSOR

Mark E. Bridges, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 11, 1988, Ser. No. 142,762

Int. Cl.[4] H04N *5/225, 3/14*

U.S. Cl. 358—229 **13 Claims**



11. An adjustable mount for positioning an image sensor along the optical axis of a device for generating video signals, said mount comprising:

a sensor carriage moveable along the optical axis, said carriage having a central opening on the optical axis, a centrally located spherical bearing recess in a lower surface thereof, and two threaded and countersunk screw holes extending downwardly from the upper surface of the carriage, one of said screw holes being on each side of and spaced from the optical axis, a portion of the countersunk section of each screw hole being open and facing in the same direction as said recess,

a flat head screw with a tapered head section in each screw hole,

an intermediate element mounted in said central opening of the carriage and having a male part complementary to and engaging said recess, said element having a transversely

extending rib in proximity to the open portions of the carriage screw holes,

said intermediate element having a central opening on the optical axis, one side wall of which opening has a downwardly sloping ramp surface, said element having threaded screw holes in its upper surface extending downwardly into said central opening, a first of said screw holes being located over said ramp surface, a second of said screw holes being on one side of the optical axis and a third being on the other side of the optical axis,

screws in the screw holes in the intermediate element,

a resilient frame-like element for receiving the sensor, said element being located in the opening in the intermediate element and having thickened areas located below the respective second and third screw holes as well as an enlarged portion below said first screw hole, said enlarged portion having a ramp surface complementary to and engaging said ramp surface of the intermediate element,

biasing means urging the frame-like element and sensor sideways toward the ramp surface of the intermediate element and upwardly, and

means for clamping the mount parts and sensor together such that:

(a) the rib of the intermediate element is biased against the tapered head sections of the screws in the carriage whereby rotation of the screws causes movement of the intermediate element about horizontal and vertical axes, depending upon whether one or both screws are rotated and the degree of rotation,

(b) rotation of the screw in the first screw hole in the intermediate element causes movement of the ramp surfaced portion of the frame-like element along the ramp surface of the intermediate element resulting in sideways movement of the sensor, and

(c) rotation of said second and third screws in the intermediate element causes rotation of the sensor about the optical axis and up and down movement of the sensor, depending upon whether one or both screws are rotated and the degree of rotation.

4,803,558

HALFTONE IMAGE ESTIMATION METHODS FOR DITHER IMAGES

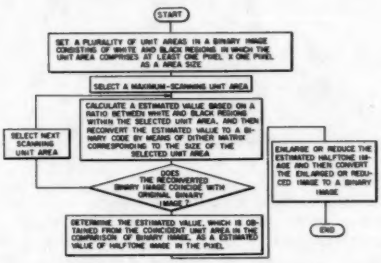
Seiichiro Hiratsuka; Masahiko Matsunawa, and Yoshinori Abe, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 929,622

Claims priority, application Japan, Nov. 15, 1985, 60-257489; Nov. 15, 1985, 60-257495

Int. Cl.[4] H04N 1/40

U.S. Cl. 358—283 **16 Claims**


START
SET A PLURALITY OF UNIT AREAS IN A BINARY IMAGE CONSISTING OF WHITE AND BLACK REGIONS IN WHICH THE UNIT AREA COMPRISES AT LEAST ONE PIXEL X ONE PIXEL AS A AREA SIZE
SELECT A MAXIMUM-SCANNING UNIT AREA
CALCULATE A ESTIMATED VALUE BASED ON A RATIO BETWEEN WHITE AND BLACK REGIONS WITHIN THE SELECTED UNIT AREA, AND THEN RECONVERT THE ESTIMATED VALUE TO A BINARY CODE BY MEANS OF DITHER MATRIX CORRESPONDING TO THE SIZE OF THE SELECTED UNIT AREA
SELECT NEXT SCANNING UNIT AREA
DOES THE RECONVERTED BINARY IMAGE COINCIDE WITH ORIGINAL BINARY IMAGE ?
ENLARGE OR REDUCE THE ESTIMATED HALFTONE IMAGE AND THEN CONVERT THE ENLARGED OR REDUCED IMAGE TO A BINARY IMAGE
DETERMINE THE ESTIMATED VALUE, WHICH IS OBTAINED FROM THE COINCIDENT UNIT AREA IN THE COMPARISON OF BINARY IMAGE, AS A ESTIMATED VALUE OF HALFTONE IMAGE IN THE PIXEL
END

1. A method of estimating a halftone image from an original binary image formed of an array of a plurality of pixels, each of said pixels having one of two different components characteristic of a binary image, comprising the steps of:

(a) selecting a group of differently configured scanning area units ("SAU's"), each of said SAU's being adapted to enclose a portion of the original binary image having a predetermined number of pixels of said array to be represented with a halftone level;

(b) selecting a first target pixel from among the array of a plurality of pixels;

(c) choosing one of said group of SAU's;

(d) setting said chosen SAU onto a portion of the original binary image which includes said first target pixel;

(e) obtaining a counted value of the number of pixels in the portion of the original binary image enclosed within said chosen SAU which have the same one of the two characteristic components of a binary image;

(f) assigning a halftone level related to said counted value to each of the pixels in the portion of the original binary image enclosed within the chosen SAU;

(g) converting the assigned halftone level into a converted binary image with a threshold value matrix, said threshold vlaue matrix having a plurality of threshold values corresponding in number to the predetermined number of pixels in the portion of the original binary image enclosed within the chosen SAU;

(h) comparing an image pattern of the converted binary image with that of the portion of the original binary image enclosed by said chosen SAU to obtain a comparison result;

(i) determining whether the comparison result satisfies a predetermined condition and, if it does, to provide an identified SAU for the first target pixel;

(j) if the comparison result does not satisfy the predetermined condition of step (i) for the chosen SAU, repeating steps (c)–(i) for other SAU's in said group of SAU's chosen in sequence until an identified SAU is found;

(k) generating an estimated halftone image for the first target pixel related to the assigned halftone level obtained with the identified SAU in step (f);

(l) sequencing to a next target pixel in the array of a plurality of pixels; and

(m) repeating steps (c)–(k) for the next target pixel.

4,803,559

METHOD OF MOUNTING A DEFLECTION UNIT ON A CATHODE RAY TUBE ENVELOPE AND COMBINATION RESULTING THEREFROM

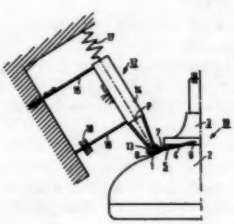
Hermanus M. J. R. Soemers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 27, 1987, Ser. No. 125,857

Claims priority, application United Kingdom, Dec. 3, 1986, 8628906

Int. Cl.[4] H01J 9/236, 9/42

U.S. Cl. 358—248 **2 Claims**



1. A method of mounting a deflection-unit on a cathode ray tube envelope, comprising thermally compression bonding metal mounting pads at predetermined positions on the envelope; providing at least six connecting members to the deflection unit, pairs of the connecting members having corresponding ends connected at spaced apart positions to the deflection unit, each connection point being contiguous with a connec-

tion point of an end of an adjacent member of another pair, the members of each pair being mutually convergent so that their terminal points are contiguous, providing each terminal point with a semi-spherical part having a hole therein through which a portion of the terminal point is visible; disposing a deflection unit on the envelope; resiliently urging manipulators each comprising a socket against respective semi-spherical parts in such a manner that the socket frictionally engages the respective semi-spherical part and that the contiguous terminal portions of the pairs of connecting members are contacting substantially tangentially their respective mounting pad; displaying a test pattern on the cathode ray tube; and actuating the manipulators to adjust the deflection unit until an optimum test pattern is obtained and with the manipulators in engagement with the semi-spherical parts laser-welding the terminal portion to their respective mounting pad via a laser-beam produced within each manipulator and passing through the hole in its associated semi-spherical part.

4,803,560

LIQUID-CRYSTAL TELEVISION RECEIVER WITH CASSETTE TAPE RECORDER

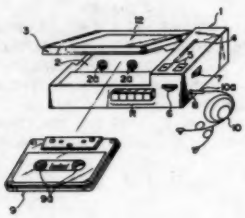
Tsuyoshi Matsunaga, and Hideaki Shimizu, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,721

Claims priority, application Japan, Feb. 21, 1986, 61-22955[U]; Mar. 31, 1986, 61-46283[U]; Dec. 24, 1986, 61-197321[U]

Int. Cl.⁴ H04N 5/64

U.S. Cl. 358—236 **12 Claims**



1. A liquid-crystal television receiver in combination with a tape recorder, comprising:

a main body including a cassette tape driving mechanism and having a cassette loading section;

a television reception circuit means for receiving a television signal;

a first pivotal lid pivotally coupled to said main body and adapted to cover a cassette tape when a cassette tape is loaded into said cassette loading section;

a second pivotal lid pivotally arranged relative to said first pivotal lid;

an optical means comprising a reflection mirror arranged on a surface of said first pivotal lid for facing said second pivotal lid; and

a transmission type liquid-crystal display means arranged on the second pivotal lid for displaying, in cooperation with said optical means, a television image corresponding to the television signal received by said television reception circuit.

4,803,561

IMAGE READING METHOD AND APPARATUS

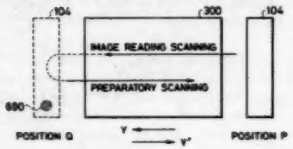
Jun Kubota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 13, 1987, Ser. No. 3,008

Claims priority, application Japan, Jan. 13, 1986, 61-4851

Int. Cl.⁴ H04N 1/04

U.S. Cl. 358—285 **7 Claims**



5. An image reader, comprising a one-dimensional sensor arranged along a first direction;

means for moving said sensor from a first position to a second position and from said second position to said first position along a direction non-parallel to said first direction;

means for measuring, by means of one-dimensional sensor, reading conditions of said one image while said moving means moves said one-dimensional sensor from said second to said first position; and

means for two-dimensionally scanning said one image, by means of said one-dimensional sensor, while said moving means moves said one-dimensional, sensor from said first to said second position.

4,803,562

IMAGE SENSING APPARATUS

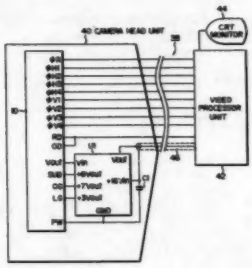
Teruo Eino, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1987, Ser. No. 62,098

Claims priority, application Japan, Jun. 20, 1986, 61-144514; Jun. 20, 1986, 61-144517

Int. Cl.⁴ H04N 7/18, 3/18

U.S. Cl. 358—98 **14 Claims**



1. An image sensing apparatus comprising:

video processor means for generating a drive signal; and

camera head means connected to said video processor means, said camera head means having

solid-state image sensing means which requires a plurality of power supply voltages for operating in response to the drive signal supplied from said video processor means so as to generate an image signal, and

emitter follower means connected to a power supply voltage terminal of said solid-state image sensing means, the plurality of power supply voltages being applied to said

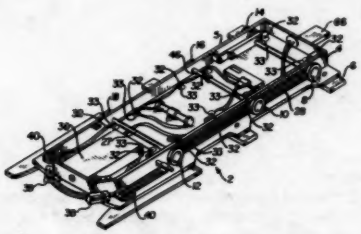
solid-state image sensing means through said emitter follower means.

4,803,563

ROTOR-IN-STATOR EXAMINATION MAGNETIC CARRIAGE AND POSITIONING APPARATUS

George F. Dailey, Plum Borough, and Paul E. Morrison, Trafford, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 2, 1987, Ser. No. 92,790
Int. Cl.[4] H06N 7/18
U.S. Cl. 358—100 19 Claims



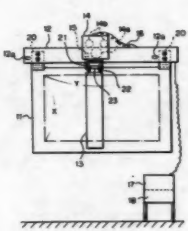
1. A moveable carriage comprising:
chassis means adapted for movement along a surface;
magnet means attached to said chasis means for moveably securing said chasis means to the surface; and
separator means interposed between said magnet means and the surface for relatively positioning said magnet means out of contact with the surface.

4,803,564

ELECTRONIC BLACKBOARD SYSTEM

Katsuyoshi Sakai, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 92,427
Claims priority, application Japan, Sep. 8, 1986, 61-211017
Int. Cl.[4] H04N 1/10
U.S. Cl. 358—294 21 Claims



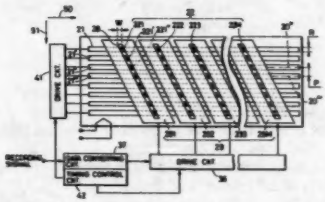
1. An electronic blackboard system comprising:
an attachment means fixed to the upper portions of an information writing board such as a white board or a blackboard attached to a wall surface or fixed to a wall surface above such an information writing board;
said attachment means comprising a pair of spacedly disposed angle members each respectively located adjacent an upper corner of the information writing board;
means securing the angle members to the information writing board in such spaced apart relationship;
a guide rail secured by said attachment means and horizontally disposed along an upper edge of said information writing board;
means securing the guide rail at ends thereof to respective angle members;
a driving unit placed on said rail an moving thereon in the horizontal direction;
a photoelectric conversion device, connected to said driving unit in such a manner as to face the surface of said information writing board, for reading written information;
a memory for storing pieces of image information of a whole picture obtained by moving said photoelectric device in the direction intersecting the read-out line;
a hard-copy device for reading out said image information stored in said memory and recording said image information; and
a roller secured to the lower end of said photoelectric conversion device, said roller rolling while being in contact with said information writing board.

4,803,565

OPTICAL WRITE HEAD

Toru Teshigawara; Kazuo Terao, both of Kanagawa; Hiroshi Watanabe, and Yukihiko Shimizu, both of Chiba, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo and Futaba Corporation, Chiba, both of Japan

Continuation of Ser. No. 897,829, Aug. 19, 1986, abandoned.
This application Jul. 29, 1988, Ser. No. 226,548
Claims priority, application Japan, Dec. 12, 1985, 60-278044
Int. Cl.[4] H04N 1/23
U.S. Cl. 358—300 3 Claims



1. An optical write head for an electrostatic recorder adapted to form a latent image on photosensitive material moving relative thereto, the head comprising:
at least first and second adjacent rows of light emission element arrays each including a plurality of light emission elements, said row-arrays having center lines and being disposed with said center lines parallel o each other and spaced at predetermined intervals in the direction perpendicular to the row-wise direction, the light emission elements on adjacent arrays being staggered in row-wise position for disposing all of the light emission elements at equal row-wise direction intervals when viewed from a direction perpendicular to the arrays;
dynamic driving circuit means for activating the rows of light emission elements at different times to emit light successively array by array in the order from said first array to said second array to irradiate the photosensitive material for forming a latent image comprised of a matrix of dots arranged regularly in the row-wise direction and in the direction perpendicular thereto, a latent image of one line comprised of dots arranged in a direction perpendicular to the row-wise direction being formed on the photosensitive material once each of the rows of light emission elements emits light, and
said predetermined intervals between the respective center lines of the light emission element arrays being determined from the following relationship:

$$P=(X\cdot N+1)\cdot S/N$$

wherein P represents said predetermined intervals between said center lines, S represents the pitch of the printed dots

in the direction perpendicular to the row-wise direction, X represents an integer, and N represents the number of the light emission elements arrays, and

wherein the minus sign is used when said photosensitive material moves said selected distance in the direction from the first light emission element array toward the second light emission element array, and said driving circuit means is operative to activate said second array to emit light earlier in time than said first array, and the plus sign is used when said photosensitive material moves said selected distance in the direction from the first light emission element array toward the second light emission element array, and said driving circuit means is operative to activate said second array to emit light later in time than said first array.

4,803,566

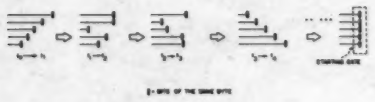
DIGITAL TIME BASE CORRECTION USING A REFERENCE BIT

Elwyn R. Berlekamp, Berkeley; James A. Bixby, San Diego, and James U. Lemke, Del Mar, all of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1983, Ser. No. 518,995

Int. Cl.[4] G11B *5/00, 5/09, 27/19, 27/28*

U.S. Cl. 360—26 **13 Claims**



1. Apparatus for assuring time coherence among data bits in a multi-channel bit-processing system, groupings of said bits comprising respective bytes, and said bytes occurring in a time sequence, said apparatus comprising:

(a) respective clockable multi-bit buffer means for receiving the bits of said sequenced bytes,

(b) means for detecting the occurrence of a reference bit for, and from within, each of a plurality of said bytes, and

(c) means responsive to reference bit occurrences for producing a clock having a frequency corresponding thereto, said clock being applied to each of said buffer means for clocking therefrom data bits which are essentially devoid of time incoherence thereamong, said means for detecting the occurrence of a reference bit being means for detecting the median-occuring bit of each of said plurality of bytes.

4,803,567

VIDEO REPLAY STORE FOR A MULTI-CHANNEL DIGITAL VIDEO TAPE RECORDER

James H. Wilkinson, Yokohama, Japan, and Richard J. A. Avis, Basingstoke, United Kingdom, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 30, 1986, Ser. No. 925,377

Claims priority, application United Kingdom, Nov. 6, 1985, 8527321

Int. Cl.[4] H04N *5/78*

U.S. Cl. 360—33.1 **7 Claims**

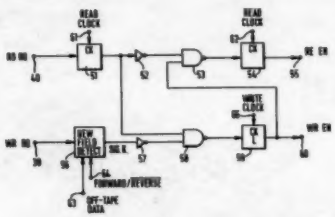
1. A video replay store for a multi-channel digital video tape recorder, the video replay store, comprising:

a respective channel store for each channel, each said channel store comprising a plurality of field stores which are written in and read from cyclically;

a respective field boundary detector for each channel, each said field boundary detector supplying a first pulse in response to each field boundary where an odd field changes to an even field, and a second pulse in response to each field boundary where an even field changes to an odd field, in the off-tape data in the respective channel;

a replay store controller for supplying write requests and read requests in a predetermined sequence to all of said channel stores, said replay store controller stepping on from one state to a next state in said predetermined sequence in response to stepping pulses formed by each first said first pulse following a said second pulse and each first said second pulse following a said first pulse; and

a control circuit for each said respective channel store, each said control circuit including a first gate circuit for gating each write request received from said replay store con-



troller with a read request received from said replay store controller so as to derive a first output signal used to form a write enable, and a second gate circuit for gating each read request received from said replay store controller with said first output signal to derive a second output signal used to form a read enable, whereby said control circuit supplies write enables and read enables to said field stores with read enables dominating over write enables in the event of contention between a read enable and a write enable.

4,803,568

MOTOR CONTROL APPARATUS EFFECTING PHASE CONTROL ON ROTATING BODY

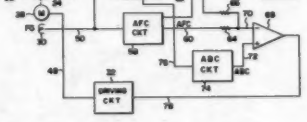
Izumi Miyake; Kiyotaka Kaneko, and Kazuya Oda, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 2, 1986, Ser. No. 937,038

Claims priority, application Japan, Dec. 2, 1985, 60-269495

Int. Cl.[4] H04N *5/781;* **G11B** *19/20*

U.S. Cl. 360—33.1 **9 Claims**



1. A motor control apparatus comprising:

drive means including a motor for rotating a body at a predetermined rotating speed and phase;

reference position detecting means for determining a reference position in the rotation of the body and generating a phase signal representative of the reference position;

phase control means, responsive to said reference position detecting means, for controlling said drive means by use of a bias signal, said bias signal representing an offset of the phase of the rotating body;

said phase control means causing the rotation of the body to be brought within a predetermined range with respect to

a reference signal, said reference signal representing said predetermined rotating speed; and

bias control means, operatively connected to said phase control means, for determining a difference between said phase signal and said reference signal and for providing said drive means with said bias signal according to the determined difference;

said phase control means including first counter means for counting a period within the predetermined range;

said bias control means including second counter means, responsive to said first counter means, for incrementing a control count when a count contained in said first counter means is below a lower limit of the predetermined range and for a decrementing said control count when the count exceeds an upper limit of the predetermined range, said control count representing a value of said bias signal, thereby generating said bias signal according to the value of said control count of said second counter means.

4,803,569

WRITE ENABLE RING SENSING ARRANGEMENT FOR A MAGNETIC TAPE REEL

Ernst Kegler; Konrad Svenka, and Klaus Thierauf, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 558,879

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304261

Int. Cl.[4] G11B *15/05, 15/06*

U.S. Cl. 360—60 **6 Claims**

1. A sensing arrangement for detecting the presence and absence of a write enable ring within a groove of a rotatable magnetic tape reel, comprising:

a write enable ring to be received in the groove of the rotatable magnetic tape reel;

a sensing ring mounted for rotation and axial movement including a portion to be received in the groove of the magnetic tape reel in the absence of the write enable ring, a peripheral reflective surface of high reflectivity, and a mark on said surface;

a single sensing element positioned to scan and sense said peripheral reflective surface and said mark to produce scanning signals only when said write enable ring is located in the groove and said sensing ring rotates; and

an evaluation stage for evaluating the scanning signals for determining the axial position and rotation of said sensing ring.

4,803,570

ROTARY HEAD TYPE MULTICHANNEL INFORMATION SIGNAL REPRODUCING APPARATUS HAVING SUB-INFORMATION SEARCH FUNCTION

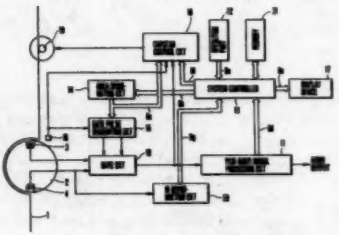
Motokazu Kaskida, Tokyo; Toshiyuki Masui, Kanagawa; Tsutomu Fukatsu, Kanagawa; Koji Takahashi, Kanagawa; Masahiro Takei, Kanagawa, and Kenichi Nagasawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1986, Ser. No. 891,253

Claims priority, application Japan, Aug. 6, 1985, 60-172739; Aug. 7, 1985, 60-173792

Int. Cl.[4] G11B *5/02*

U.S. Cl. 360—61 **13 Claims**



1. An apparatus for reproducing main information and additional information from a tape-shaped record bearing medium which has a plurality of areas extending longitudinally and in parallel with each other, each area having many helical slant tracks on each of which the main and additional information are recorded, said main information in one of said many helical tracks being larger in quantity than said additional information, comprising:

(a) a rotary head arranged to transversely trace the plurality of areas provided on said tape-shaped record bearing medium;

(b) area designating means for designating one of said plurality of areas;

(c) gate means arranged to gate a signal reproduced by said rotary head in response to said area designating means for outputting informations recorded on said one of said plurality of areas;

(d) first process means for processing said main information gated by said gate means;

(e) second process means for processing said additional information reproduced by said rotary head; and

(f) manually operable means for changing over a plurality of operation modes of the apparatus, the plurality of modes including

a first mode in which: said first process means outputs said main information recorded in the area designated by said area designating means, and said second process means only outputs said additional information recorded in the same area from which said main information is being outputted by said first process means; and

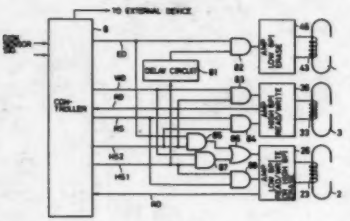
a second mode in which: said second process means simultaneously outputs said additional information from at least two of said plurality of areas.

4,803,571

FLOPPY DISC MAGNETIC HEAD APPARATUS COMPATIBLE WITH BOTH HORIZONTAL AND PERPENDICULAR RECORDING MEDIA

Toshiyuki Fujioka, Nishitama; Masahiro Kusunoki, Tachikawa, and Koji Onufune, Nishitama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 31, 1987, Ser. No. 32,442
Claims priority, application Japan, Mar. 31, 1986, 61-70731
Int. Cl.[4] G11B 5/48
U.S. Cl. 360—63 **6 Claims**



1. A magnetic head apparatus compatible with both horizontal and perpendicular recording media, comprising:

(a) first magnetic head means for recording and reproducing information in or from said horizontal recording medium at a first predetermined recording density;

(b) second magnetic head means, arranged backward from said first magnetic head means in a magnetic recording medium travel direction, for recording and reproducing information in or from said perpendicular recording medium at a second predetermined recording density higher than that of said horizontal recording medium; and

(c) head selecting means for selecting any one of the first and second magnetic head means in response to a signal indicative of the presence of any one of the horizontal and perpendicular recording mediums.

4,803,572

RECORDING/REPRODUCING METHOD AND APPARATUS OF MAGNETIC DISK UNIT IN WHICH PLAYBACK COMMENCES BEFORE THE MAGNETIC HEAD IS COMPLETELY CENTERED ON THE TRACK

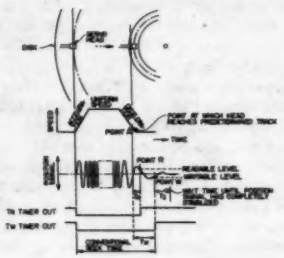
Toshiyuki Haruna, Odawara; Kenji Nishimura, Kanagawa; Yuji Yoshida, Odawara; Kiyotaka Takahashi, Atami; Tsuneo Hirose, Odawara; Katsuhiro Tsuneta, Odawara; Riichi Nakano, Odawara; Kazuto Takahashi, Hadano; Akira Kurano, and Tadayuki Ichiba, both of Odawara, all of Japan, assignors to Hitachi, Ltd. and Hitachi Computer Peripherals Co., Ltd., both of Tokyo, Japan

Filed Apr. 20, 1987, Ser. No. 40,126
Claims priority, application Japan, Apr. 21, 1986, 61-89935
Int. Cl.[4] G11B 5/55, 15/87
U.S. Cl. 360—60 **10 Claims**

1. A recording/reproducing method of an information disk unit effecting data recording/reproducing operation by means of a head on the basis of a seek command and a recording/reproducing command received from a host processor and performing a seek operation, comprising:

a first step for starting the data reproduction on the basis of said data reproducing command in response to detection of such a state that said head has sought to an extent that the data on the desired track can be marginally reproduced; and

a second step for starting the data recording on the basis of said data recording command in response to detection of



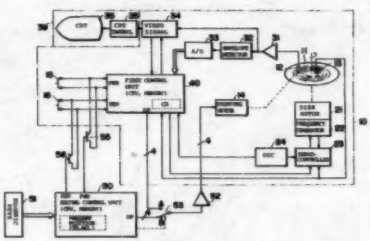
such a state that the position of said head has stabilized on the desired track by means of the seek operation.

4,803,573

TRACK ACCESS APPARATUS HAVING HIGH-SPEED RANDOM ACCESS USING A SINGLE STEPPING MOTOR IN A MAGNETIC RECORDING/PLAYBACK SYSTEM

Nobuo Minoura, Yokohama; Katsuo Nakadai; Toshikatsu Harase, both of Tokyo, and Satoshi Iwamatsu, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 15, 1986, Ser. No. 919,140
Claims priority, application Japan, Oct. 15, 1985, 60-227918; Oct. 15, 1985, 60-227919; Oct. 15, 1985, 60-227920; Oct. 15, 1985, 60-227921; Oct. 15, 1985, 60-227922
Int. Cl.[4] G11B 5/55
U.S. Cl. 360—78.13 **6 Claims**



1. In a magnetic recording/playback system having a magnetic recording/playback head freely movable radially across a rotatable magnetic disk on which are provided a plurality of circular, concentrically arranged recording tracks; a single magnetic recording/playback head transfer mechanism which includes a single stepping motor, responsive to first and second drive pulses, for moving the magnetic recording/playback head; an envelope detector circuit for detecting an envelope of a signal read from the disk by the magnetic recording/playback head; and tracking control means for generating said first drive pulses to be applied to the stepping motor of said magnetic recording/playback head transfer mechanism for controlling the magnetic recording/playback head transfer mechanism to move the magnetic recording/playback head in a forward/reverse direction in response to a forward-feed/reverse-feed signal, and to position the magnetic recording/playback head on an adjacent one of said recording tracks in the forward/reverse direction in response to an output from the envelope detector circuit; a track access apparatus comprising:

means for designating a track number of a track to be accessed;

means for storing a track number of a track at which the magnetic recording/playback head is presently located;

fast-feed control means for performing a fast feed operation including determining a head feed direction of movement of the magnetic recording/playback head based on the designated track number, generating said second drive pulses to be supplied to the stepping motor of said recording/playback transfer mechanism, and controlling the magnetic recording/playback head transfer mechanism to move the magnetic recording/playback head in the head feed direction to a track that is one track short of the designated track; and

means for providing the tracking control means with one forward-feed/reverse-feed signal corresponding to the head feed direction after the fast-feed control operation performed by said fast-feed control means.

4,803,574

ARRANGEMENT OF RECORDING AND/OR REPRODUCING APPARATUS

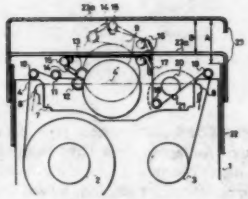
Akio Konishi; Satoshi Kikuya; Osamu Zaitsu, and Hideaki Yoshio, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 2, 1987, Ser. No. 10,958

Claims priority, application Japan, Feb. 3, 1986, 61-21437; Sep. 5, 1986, 61-209866; Nov. 5, 1986, 61-263395

Int. Cl.[4] G11B *5/027*

U.S. Cl. 360—85 **10 Claims**



1. A recording/reproducing apparatus comprising tape winding means describing a locus of movement for rotationally moving around a tape guide drum and for pulling out a tape from a tape cassette and winding the pulled-out tape around said tape guide drum, said recording/reproducing apparatus having a movable casing section member which moves from a position remotely located relative to the locus of the rotational movement of said tape winding means to a position entering into the locus of movement after said tape winding means is rotationally moved through a predetermined angle.

4,803,575

TAPE CASSETTES HAVING BOTTOM GROOVES FOR USE IN TAPE RECORDER HAVING BOTTOM PROJECTION IN CASSETTE HOLDER

Akihiro Nishimura, Osaka; Masao Kawagishi, Nara; Hideki Sakumoto; Masahiko Matsui, both of Osaka, and Yoshinori Shiomi, Okayama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 10, 1987, Ser. No. 36,971

Claims priority, application Japan, Apr. 11, 1986, 61-84504

Int. Cl.[4] G11B *15/675, 23/087*

U.S. Cl. 360—94 **12 Claims**

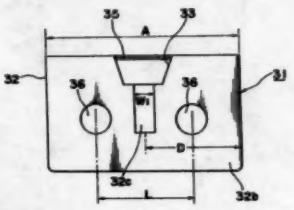
1. A cassette for use in a tape recorder having a cassette holder defined by a bottom plate, opposite side plates, a projection on the bottom plate extending parallel to the side plates and reel shaft openings on opposite sides of the projection, said cassette comprising:

a top shell;

a bottom shell connected with said top shell to define a rectangular casing having end walls parallel to the side plates of the cassette holder;

reels in said casing for storing a magnetic tape wound on said reels, said reels being spaced a distance corresponding to the spacing of the reel shaft openings on the cassette holder;

said rectangular casing having an overall length slightly



smaller than the distance between the opposite side plates of the cassette holder;

said bottom shell having a groove extending parallel to said end walls and facing outwardly from the bottom thereof, said groove having a width substantially wider than the width of the projection, whereby when said cassette is inserted into or ejected from the cassette holder, said cassette is guided by the opposite side plates and the projection is received in said groove with substantially no contact between the bottom shell and the projection.

4,803,576

DISC DRIVING DEVICE

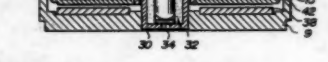
Masao Ohkita, and Shinichi Ohmori, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 21, 1987, Ser. No. 88,694

Claims priority, application Japan, Nov. 5, 1986, 61-168991[U]

Int. Cl.[4] G11B *5/012, 5/016*

U.S. Cl. 360—99.08 **5 Claims**



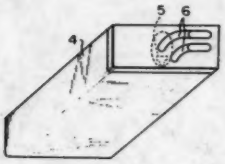
1. A disk driving device, comprising a fixed base, a metal bearing secured to said base, a spindle shaft mounted for rotation relative to said base by means of said metal bearing, a spindle fitted at an end portion of said spindle shaft remote from said base, a turntable secured to said spindle for receiving a disk for integral rotation therewith, a circuit board securely mounted on said base, a driving coil secured to said circuit board, a driving magnet secured to said spindle for electromagnetically cooperating with said driving coil to rotate said spindle, a stator yoke secured to said base, said driving magnet being located between said circuit board and said stator yoke, and a buffer member mounted on a face of said driving magnet opposing to said circuit board.

4,803,577

VERTICAL MAGNETIC RECORDING SYSTEM USING RIGID DISK

Joichiro Ezaki, and Kazumasa Fukuda, both of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,240
Claims priority, application Japan, Jun. 12, 1985, 60-128874; Jun. 12, 1985, 60-128875
Int. Cl.[4] G11B 5/60, 15/64, 17/32, 21/20
U.S. Cl. 360—102 3 Claims



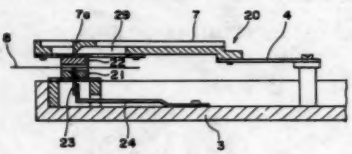
1. A system for recording and reproducing information on a magnetic recording medium by using a magnetic head through relative movement between the head and the recording medium comprising a recording disk having a rigid disk substrate made of alumina silicate resin glass, and a vertical magnetic anisotropic film coupled with said substrate, the maximum surface roughness R_{max} of said disk being less than 50 Å and the spacing between said head and said disk in operation being less than 0.1 micron.

4,803,578

ASSEMBLY FOR STABLY MOUNTING MAGNETIC HEAD ON CARRIAGE

Hideo Fujiwara; Akito Sakemoto, and Osamu Inagoya, all of Ibaragi, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed May 9, 1986, Ser. No. 861,349
Claims priority, application Japan, May 9, 1985, 60-96598
Int. Cl.[4] G11B 5/54
U.S. Cl. 360—105 15 Claims



1. A magnetic head carriage assembly for use with a magnetic disc having a single recording side which comprises:

a head carriage for slidably receiving a rotatable magnetic disc;

a clamper resiliently mounted on said head carriage and biased toward said head carriage so that said magnetic disc rotates between said clamper and said head carriage;

a first clamp shoe resilient member mounted on said clamper;

first clamp shoe means resiliently mounted on said clamp shoe resilient member for contacting said magnetic disc, wherein the movement of said first clamp shoe means is confined to a direction perpendicular to the rotational plane of said magnetic disc, and wherein said first clamp shoe means is biased to oppose said head carriage;

a second clamp shoe resilient member mounted on said head carriage;

a second clamp shoe means resiliently mounted on said second clamp shoe resilient member for contacting said magnetic disc, wherein said second clamp shoe means is biased to oppose said first clamp shoe means;

a head support resilient member mounted on said head carriage; and

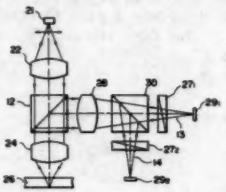
a magnetic head resiliently mounted on said head support resilient member for contacting said recording side of said magnetic disc, said magnetic head being biased so as to oppose said first clamp shoe means and being inserted through an insertion opening formed in said second clamp shoe means whereas said magnetic head is mounted such that is moves independent of movement of each of said clamp shoe means.

4,803,579

MAGNETO-OPTICAL INFORMATION REPRODUCING APPARATUS IN WHICH DIVIDED REPRODUCING LIGHTS ARE DIFFERENTIALLY DETECTED BY A PHOTODETECTOR HAVING NO AMPLIFYING ACTION THROUGH AN ANALYZER WHOSE TRANSMISSION AXIS AZIMUTH IS OPTIMIZED

Osamu Koyama, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,786
Claims priority, application Japan, Oct. 17, 1986, 61-246614
Int. Cl.[4] G11B 11/10
U.S. Cl. 360—114 5 Claims



1. A magneto-optical information reproducing apparatus comprising means for applying a light beam polarized in a predetermined direction onto a recording medium on which information is magnetically recorded, means for dividing the reflected or transmitted light beam from said recording medium modulated into a polarized state in conformity with said information by the magneto-optical effect, a plurality of analyzer means having their optic axes inclined in opposite directions with respect to said predetermined direction and analyzing said divided light beams, a plurality of photodetectors having no amplifying action and photoelectrically detecting the light beams transmitted through said plurality of analyzer means, and a signal processing means for amplifying the detection signals of said plurality of photodetectors, differentiating them and reproducing said information, the angle θ_A formed between the optic axes of said plurality of analyzer means and said predetermined direction satisfying the following conditions:

$$\sin^2\theta_A \sim \frac{S+T}{(1-\eta_A)\cdot S}\left(1-\sqrt{\frac{\eta_A S+T}{S+T}}\right)$$

$$S = 2\epsilon\kappa e|t_A|^2|R|^2 I_0 \cdot \Delta B$$

where I_0 is the quantity of light of the incident light beam on said recording medium, R is the amplitude reflectance of said recording medium, ϵ is the light utilization efficiency of the optical system from the recording medium to the photodetectors except said analyzer means, κ is the photoelectric conversion efficiency of said photodetectors, e is the amount of charge, T is the thermal noise of said amplifying means in a magneto-optical signal observation frequency, ΔB is the band width of the detection signals, t_A is the amplitude transmittance

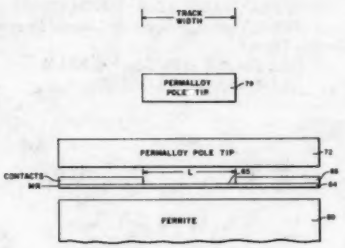
of said analyzer means, and η_A is the extinction ratio of said analyzer means.

4,803,580

DOUBLE-GAP MAGNETORESISTIVE HEAD HAVING AN ELONGATED CENTRAL WRITE/SHIELD POLE COMPLETELY SHIELDING THE MAGNETORESISTIVE SENSOR STRIP IN THE READ GAP

Greg S. Mowry, Burnsville, Minn., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Feb. 17, 1987, Ser. No. 15,204
Int. Cl.[4] G11B *5/127, 5/33*
U.S. Cl. 360—113 **2 Claims**



1. In a magnetoresistive head having a read/write surface; a pair of inductive write poles and a soft/magnetic shield forming two gaps at said read/write surface, a first gap between the poles, a second gap between one of said poles and said shield, said write poles magnetically connected in a back gap region, the write pole forming a portion of the second gap comprising a trailing pole, and the other write pole comprising a leading pole; and a magnetoresistive strip having a central sense region mounted in said second gap; the improvement comprising:

said leading one of said poles having a length defining a track width L,

the magnetoresistive strip being substantially longer than said track width L,

a pair of current contacts contacting the lateral ends of said magnetoresistive strip and defining a central sense region therebetween, wherein the central sense region of the magnetoresistive strip has approximately the same length as the leading pole, and

the trailing pole having a length at least as long as the strip, the length of the trailing pole thereby being longer than said track width L;

whereby the leading and trailing inductive write poles have substantially unequal lengths and a track is written on said read/write surface by magnetic mirroring between the leading and trailing poles, the width of the track defined by the length of the leading pole; and where by the trailing pole completely shields the elongated magnetoresistive strip from the high magnetic fields present between the leading and trailing write poles during write operations.

4,803,581

THIN FILM YOKE-TYPE MAGNETORESISTIVE HEAD

Toru Kira, Tenri; Teiichi Miyauchi, Nara; Kiyohito Nakai; Kengo Shiiba, both of Tenri, and Mitsuhiko Yoshikawa, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

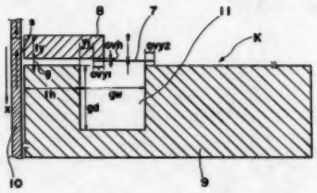
Continuation of Ser. No. 575,928, Feb. 1, 1984, abandoned. This application Mar. 16, 1987, Ser. No. 27,088
Claims priority, application Japan, Sep. 26, 1983, 58-178909
Int. Cl.[4] G11B *5/33*
U.S. Cl. 360—113 **7 Claims**

1. A thin film magnetic head comprising:

a lower yoke which is made of magnetic material having a high permeability;

a magnetoresistive element having upper and lower major surfaces, a front end portion facing a magnetic recording medium and a distal end portion spaced from said front end; and

an upper yoke, having a rectangular cross section, for transmitting magnetic flux to said magnetoresistive element, which is placed above said lower yoke so as to extend from the recording medium facing portion of said thin film magnetic head such that said magnetoresistive element is interposed between said lower yoke and said upper yoke;



said upper yoke overlapping only said front end portion of said magnetoresistive element such that the upper major surface at said distal end portion thereof is free of any magnetic material;

said lower yoke being formed, at a portion thereof confronting the lower major surface of said magnetoresistive element, with a groove such that the distal end portion of said magnetoresistive element overlaps said lower yoke;

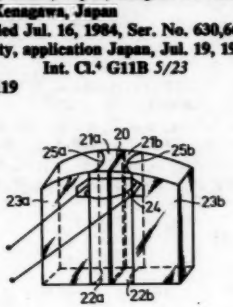
said upper and lower yokes separated by a magnetic gap of a width enabling detection of magnetization in a longitudinal direction.

4,803,582

PERPENDICULAR MAGNETIZATION TYPE MAGNETIC HEAD HAVING A MAGNETIC POLE PART WHICH FORMS A CLOSED MAGNETIC PATH

Kunihide Sakai, Ebina, Japan, assignor to Victor Company of Japan Ltd., Kenagawa, Japan

Filed Jul. 16, 1984, Ser. No. 630,660
Claims priority, application Japan, Jul. 19, 1983, 58-111981
Int. Cl.[4] G11B *5/23*
U.S. Cl. 360—119 **8 Claims**



1. A perpendicular magnetization type magnetic head comprising:

a main magnetic pole part wound with a coil, for subjecting a magnetic recording medium to magnetic fluxes which pass perpendicularly through a magnetic layer of the magnetic recording medium;

a non-magnetic part located on both sides of said main magnetic pole and adjacent to said magnetic recording medium, so as to sandwich said main magnetic pole; and

a closed magnetic path forming magnetic pole part for forming a closed magnetic path of said magnetic flux with respect to said main magnetic pole part,

said closed magnetic path forming magnetic pole part having an edge which is bounded on said non-magnetic part,

said edge facing the recording medium and being non-parallel to said main magnetic pole part.

4,803,583

CLEANING CASSETTE WITH AN INTERNAL DRIVE MOTOR

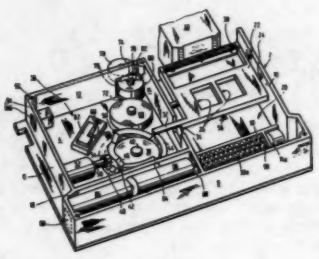
Michael Bogdanski, Salzkotten, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Apr. 16, 1987, Ser. No. 39,558

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1986, 8610911[U]

Int. Cl.[4] G11B *5/10, 5/127, 5/41*

U.S. Cl. 360—128 **22 Claims**



1. An improved cleaning cassette for cleaning an electromagnetic transducer head of a cassette tape deck, and of the type having a cassette housing capable of being inserted in the cassette receptacle of the deck, a cleaning head movably mounted in the cassette housing, and a drive system coupled to the cleaning head for moving the cleaning head relative to the transducer head, wherein the improvement comprises:

said drive system including a drive motor (52, 152) arranged inside the cassette housing (2, 102) and drivingly connected with the cleaning head (22, 122); and

means for mounting the cleaning head on said cassette housing for oscillating movement relative to said transducer head.

4,803,584

DISK CARTRIDGE WITH CLEANING SHEET OF NON-WOVEN FABRIC

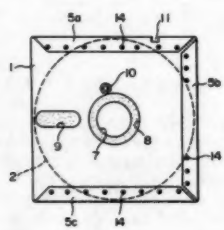
Hajime Doi; Norio Akai, and Fujio Matsumoto, all of Ibaraki, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Apr. 24, 1987, Ser. No. 42,340

Claims priority, application Japan, Apr. 25, 1986, 61-94874; May 30, 1986, 61-123545

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 **14 Claims**



1. A disk cartridge which comprises a cartridge case, a disk rotatably encased in the cartridge case, and a cleaning sheet supported on the inside surface of the cartridge case by welding, the cartridge case being composed of a thermoplastic synthetic resin, and the cleaning sheet being composed of non-woven fabric made mainly of acrylic fibers at least on the disk-facing side of the cleaning sheet, said acrylic fibers containing more than about 85% acrylonitrile, and being fixed to the inside surface of the cartridge case by ultrasonic or heat welding.

4,803,585

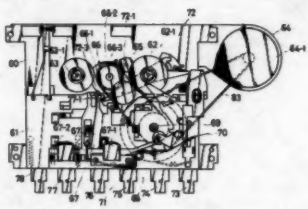
TAPE RECORDER STOP MECHANISM

H. T. Cheng, Taipei, Taiwan, assignor to Lisonic Electronic Co. Ltd., Taipei, Taiwan

Filed Feb. 17, 1987, Ser. No. 15,146

Int. Cl.[4] G11B *15/22, 21/14*

U.S. Cl. 360—96.3 **1 Claim**



1. An improvement of a tape recorder-player stop mechanism having a stop operation lever for stopping the transport of a magnetic tape which comprises:

a swivel arm, located about the pivot of a winding gear of a transmission mechanism, a split spring being connected to said swivel arm and transmission mechanism, said swivel arm being coupled to a winding intermediate gear and a push-back angle plate, said swivel arm having a middle portion positionally located below a winding reel shaft center;

a knock-back slider having a "U" shaped notch formed therein, said knock-back slider having a knock-back angle plate located on one end thereof and a knock-back edge located on an opposing end to provide a two step operation of said stop operation lever;

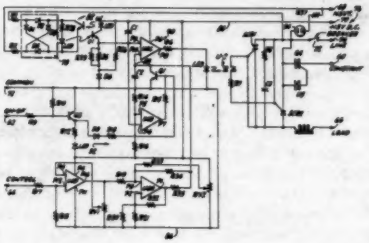
an angle plate located on said stop operation lever engaged within said "U" shaped notch of said knock-back slider when either a magnetic head operation lever or a record operation lever is operably engaged; said transport of said magnetic tape being substantially instantaneously stopped by partially depressing said stop operation lever to a first of said two step operation, said partial depression of said stop operation lever causing said knock-back slider to engage said swivel arm, said swivel arm rotates about the center of said winding reel shaft in a counter clockwise direction responsive to said engagement with said knock-back slider, said winding intermediate gear thereby being disengaged from said transmission mechanism while substantially simultaneously said knock-back angle plate causes disengagement of a pinch roller for stopping said transport of said tape, said rotation of said swivel arm also causing a magnetic head to be displaced from prior contact with said tape, the depressing of said stop operation lever to a second step of said two step operation by continued depressing of said stop operation lever results in removal of power from an electric motor coupled to said transmission mechanism.

4,803,586

VOLTAGE CONTROL MODULE

Jim Tabor, and Richard Counts, both of Dallas, Tex., assignors to Prescolite, Inc., San Leandro, Calif.

Continuation of Ser. No. 886,904, Jul. 16, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 126,422
Int. Cl.[4] H02H 3/26
U.S. Cl. 361—18 2 Claims



1. A wall box mounted remotely operated voltage control module utilizing a low voltage DC control signal to regulate the amount of electrical power transferred from a source of A.C. electrical power to a load comprising:

a. means used for rectifying the AC electrical power from the source thereof, to produce a relatively high voltage pulsation DC signal;

b. means used for transforming the relatively high voltage pulsating DC signal to relatively low voltage pulsating DC signal;

c. a power semiconductor having power leads between the source of AC electrical power and the load, and having a gate for controlling the quantity of power delivered from the source of AC electrical power to the load;

d. comparator means used for generating an output signal for triggering said gate of said power semi-conductor in accordance with said relatively low voltage pulsating DC signal and the low voltage DC control signal, said comparator means further comprising voltage compensation means used for substantially maintaining delivery of a constant quantity of power from the source to the load through said power semi-conductor during variations in the voltage of the AC electrical power from the source thereof, said means used for transforming includes an optically coupled semi-conductor device being connected between the source of AC electrical power and said comparator;

e. another optically coupled semi-conductor device for triggering said power semi-conductor, said another optically coupled semi-conductor device being connected between the output terminal of said comparator and the power semi-conductor;

f. relay means for on-off switching of said triggering signal from said comparator means;

g. means for compensating said high voltage pulsating DC power signal for changes in ambient temperature relative to the wall box, said temperature compensation means including;

a first optically coupled transistor including a light emitting diode portion, said light emitting diode portion of said first optically coupled transistor connected in parallel with said rectifying means; and

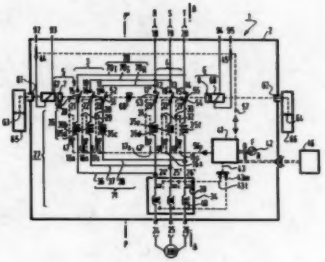
a second optically coupled transistor including a light emitting diode portion, said light emitting diode portion of said second optically coupled transitor connected in series with said transistor of said first optically coupled transistor connected in parallel with said light emitting diode of said first optically coupled transistor.

4,803,587

ARRANGEMENT FOR CHANGE-OVER CONTACT APPARATUS PROTECTION WITH INTERLOCKING MEMBER AND MODULE

Bernard Fournier, le Plessis Bouchard; Maurice Contal, Nanterre, and André Vergez, Villenes, all of France, assignors to La Telemecanique Electrique, France

Filed Apr. 15, 1987, Ser. No. 38,671
Claims priority, application France, Apr. 23, 1986, 86 06138
Int. Cl.[4] H02H 7/08; H01H 50/18
U.S. Cl. 361—24 14 Claims



1. A change-over contact apparatus comprising in a main case having first and second inner spaces defined by a median plane and a supporting base at right angles with said median plane:

i- first and second isolated three phase switch system each having input terminals and output terminals, said first and second systems being respectively housed in the respective first and second spaces;

ii- first and second electromagnets having respective coils and separate means for energizing said respective coils, the first and second electromagnets being respectively housed in the respective first and second spaces and having first and second respective armatures which respectively control the first and second switch systems;

iii- mechanical inter armature locking means disposed between the first and second respective armatures and extending from side to side of the median plane;

iv- an elongate first bundle of electric conductors providing cross connection of the input terminals of the respective switch systems for causing a reversal of two phases, said bundle being oriented substantially at right angles with said median plane and located in a region close to said supporting base;

v- a removable thermal and magnetic overload detector module removably connecting the output terminal of the second switch system to output terminals of the apparatus, said detection module, the input and output terminals of the second switch and the output terminals of the apparatus being housed in said second space;

vi- an elongate second bundle of electric conductors providing direct phase to phase connection of the output terminals of the respective switch systems and

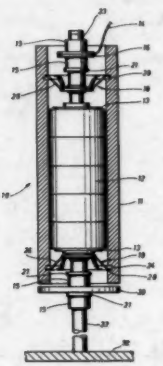
vii- a tripping mechanism housed in said second space and coupled to the overload detector module and to the first and second switch systems for opening the said switch systems when the overload detector module has detected an overload.

4,803,588

SURGE ARRESTER

Richard J. Badak, Allegany, N.Y., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 14, 1986, Ser. No. 852,004
Int. Cl.[4] H02H 3/20
U.S. Cl. 361—118 9 Claims



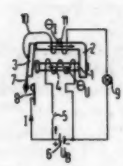
1. A surge arrester comprising:
an insulating tubular housing open at one end;
retaining means located within said housing;
at least one varistor block;
a first spring clip having open areas for the free flow of oil, mounted within said housing in electrical contact with one face of said varistor block and in contact with said retaining means to flexibly retain said varistor block in said housing;
a second spring clip having open areas for the free flow of oil, mounted within said housing in electrical contact with the opposite face of said varistor block and in contact with said retaining means to flexibly retain said varistor block in said housing wherein said retaining means is an annular groove in said housing.

4,803,589

ELECTROMAGNETIC RELAY

Rolf-Dieter Kimpel, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 9, 1987, Ser. No. 1,979
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1986, 3601519
Int. Cl.[4] H01H 47/00, 9/00; H01F 5/00
U.S. Cl. 361—210 4 Claims



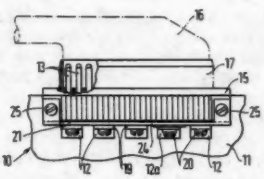
1. An electromagnetic relay having an excitation winding connectable to a voltage source ahd having a core within the winding forming an excitation flux circuit together with a yoke disposed outside of the winding to conduct electromagnetic flux in a first direction, an armature seated at the yoke forms a working air gap with a free end of the core, at least one switch contact being actuatable by the armature when said electromagnetic flux is conducted in the first direction, comprising:
power supply elements connecting the at least one switch contact to a load circuit and to the voltage source, the voltage source being connectable to the excitation winding, at least one of the power supply elements being conducted around a part of the excitation flux circuit substantially fewer times than the excitation winding so that current connected by said at least one switch contact from said voltage source to the load circuit flows through said power supply elements to produce an auxiliary excitation in said part isodirectionally with said first direction of said electromagnetic fluxes of the excitation winding, both said excitation winding and said load circuit being connected across said voltage source so that a peak load current caused by closing of said at least one switch contact flows through said power supply elements simultaneously with a drop in voltage across the excitation winding to add said auxiliary excitation to said electromagnetic flux of the excitation of said excitation winding thereby holding the armature closed during a drop in the flux of the excitation winding caused by the drop in voltage.

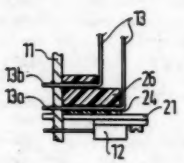
4,803,590

ELECTRIC SWITCHING DEVICE

Reinhard Fassel, Obersasbach; Georg Haubner, Berg, and Hartmut Zöbl, Fürth/Bay, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00110, § 371 Date Mar. 23, 1987, § 102(e) Date Mar. 23, 1987, PCT Pub. No. WO87/01007, PCT Pub. Date Feb. 12, 1987
PCT Filed Mar. 14, 1986, Ser. No. 41,084
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1985, 3527208
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—386 10 Claims





1. Switching device including at least one power switching component arranged in a completely insulated housing, comprising at least one heat conducting cooling body arranged in said housing for supporting said power switching component; a plurality of connector parts arranged opposite said cooling body and being fed through said housing; heat conducting, electrically insulating means having an area contact with said cooling body and enclosing portions of said connector parts in said housing to establish a path for abducting out of said housing the heat generated by said power switching component.

4,803,591

DIELECTRIC CERAMIC COMPOSITION FOR MULTILAYER CAPACITOR

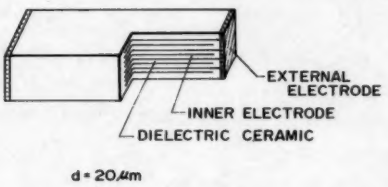
Yasuo Miyashita, Chichibu, and Masao Kashima, Yokoze, both of Japan, assignors to Mitsubishi Mining & Cement Company, Ltd., Japan

Continuation-in-part of Ser. No. 697,201, Jan. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 451,930, Dec. 21, 1982, abandoned. This application Jan. 30, 1987, Ser. No. 8,688

Claims priority, application Japan, Jul. 20, 1982, 57-125138

Int. Cl.[4] H01G 4/12; C04B 35/46

U.S. Cl. 361—321 3 Claims



1. A multilayer ceramic capacitor comprising a plurality of ceramic layers, a plurality of inner electrodes interposed between said ceramic layers, and outer electrodes on opposing sides of said capacitor for connecting alternate inner electrodes, wherein said ceramic layers consist essentially of 94.70–99.39 mole % of barium titanate, 0.50–3.00 mole % of niobium pentoxide, 0.10–1.00 mole % of zinc oxide, and 0.01–0.30 mole % of manganese dioxide.

4,803,592

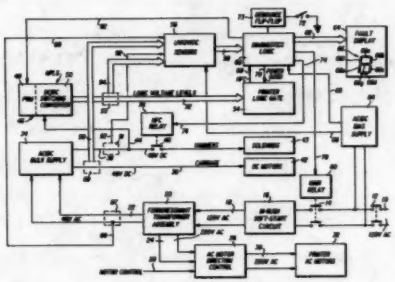
POWER CONTROL AND FAULT ISOLATION INDICATOR

Donald J. Ashley, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 877,857, Jun. 24, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 146,132

Int. Cl.[4] H02H 3/04

U.S. Cl. 361—79 12 Claims



1. A power control and fault isolation indicator, comprising:

means for sensing conditions in output lines from voltage source sections of a power supply system, said means for sensing including a plurality of sense lines, each corresponding to a point on one of said output lines, one logic level on a sense line representing a normal condition at said corresponding point and a second logic level on a sense line representing a fault condition at said corresponding point;

first logic circuit means connected to said sense lines and responsive to said second logic level on one of said sense lines for generating a code signal representing said corresponding point at which said fault condition occurred, and including storage means having output terminals for storing said code signal, said code signal appearing as a particular pattern of logic levels on a plurality of code lines connected from said output terminals;

second logic circuit means connected to receive inputs from said code lines and responsive to said code signal when said code signal signifies a fault condition at one of said points to generate at least a first shutdown signal;

means in said power supply system responsive to said first shutdown signal for shutting down said power system; and

indicating means responsive to said code signal on said code lines for indicating said point at which said fault condition occurred.

4,803,593

FLAT SOLID DISCHARGING DEVICE

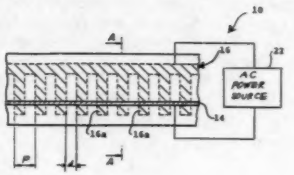
Kazuyoshi Matsumoto, Tokyo; Seiichi Miyakawa, Nagareyama; Eishu Ohdake, and Shigeru Suzuki, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,610

Claims priority, application Japan, Oct. 14, 1986, 61-156138[U]; Oct. 28, 1986, 61-254602

Int. Cl.[4] G03G 15/02; H01T 19/00

U.S. Cl. 361—225 11 Claims



1. A flat solid discharging device comprising:

a dielectric substrate substantially rectangular in shape;

a thin hairline type first electrode placed on one side of said dielectric substrate extending along the length of said discharging device;

a second electrode placed directly on the other side of said dielectric substrate to face said first electrode through said dielectric substrate; and

a means for applying an ac voltage across said first and second electrodes to produce ions in a space adjacent to said first electrode;

wherein said second electrode comprises a plurality of comblike conductive strips having spaces therebetween each extending crosswise relative to the length of said first electrode through said dielectric substrate.

4,803,594

WAVE-SHAPED ELECTROSTATIC DISCHARGE

George Zagravu, Arlington, Mass., assignor to KeyTek Instrument Corp., Wilmington, Mass.

Filed Feb. 26, 1988, Ser. No. 160,645

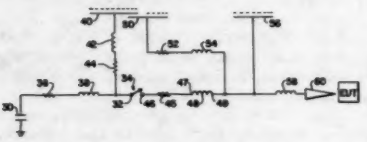
Int. Cl.[4] H01T 23/00

U.S. Cl. 361—230 11 Claims

1. In apparatus for applying through a conductive test tip a test electrical surge to equipment under test, said apparatus including a discharge capacitor series connected through a first RL circuit to an input terminal of switching means for selectively applying a discharge from said capacitor to said test tip, said input terminal also being series connected through a second RL circuit to one electrically conductive plate of a first free space capacitance, the improvement comprising:

a resistor, one end of which is connected to the output terminal of said switching means;

first and second inductances series connected to one another and between the other end of said resistor and said test tip;



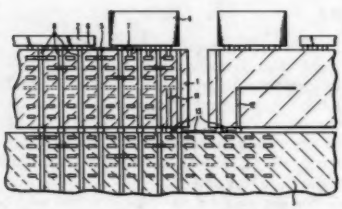
a second electrically conductive plate connected to the junction of said first and second inductances so as to form part of a second free space capacitance.

4,803,595

INTERPOSER CHIP TECHNIQUE FOR MAKING ENGINEERING CHANGES BETWEEN INTERCONNECTED SEMICONDUCTOR CHIPS

Charles J. Kraus, Poughkeepsie, and Leon L. Wu, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 931,488, Nov. 17, 1986, abandoned.
This application Nov. 25, 1987, Ser. No. 129,404
Int. Cl.[4] H05K *1/18*
U.S. Cl. 361—412 **6 Claims**



1. A structure for making engineering changes to form a replacement wiring network between designated chips on a common substrate without requiring any changes to the common substrate or the use of discrete wires, said structure comprising:

interposers being located between each of said designated chips and said common substrate,

each interposer having conductive vias and stacked internal multiple wiring planes insulated from each other and from said vias,

said vias making electrical connections between said chips and said substrate so that said chips are connected to each other and to said common substrate via said interposers, and

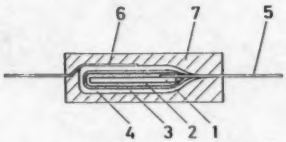
replacement interposers which lie at the beginning and at the end of the replacement wiring network for making engineering change connections without the use of discrete wires and associated engineering change pads so that the electrical connections between said chips are changeable in accordance with changes in the connections between said vias and said wiring planes of said replacement interposers.

4,803,596

SOLID-STATE CAPACITOR WITH AN ELECTROCONDUCTIVE POLYMER AS CONSTITUENT OF THE SOLID ELECTROLYTE

Gerhard Hellwig, Stegen; Ottmar Baur, Freiburg; Klaus Feiust, Kirchzarten; Helmut Moehwald, Heidelberg, and Helmut Muenstedt, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 23, 1987, Ser. No. 111,604
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636100
Int. Cl.[4] H01G *9/00*; B01J *17/00*
U.S. Cl. 361—525 **8 Claims**



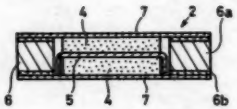
1. A solid-state capacitor comprising a first metallic electrode, an oxide layer on the electrode as the dielectric layer and a counter electrode consisting of an intrinsically conductive polymer of a 5- or 6-membered aromatic heterocyclic compound, said polymer have been formed by oxidative polymerization of the monomers on the surface of the dielectric layer by means of an oxidant.

4,803,597

ELECTRIC DOUBLE-LAYER CAPACITOR

Kouichi Watanabe; Michinobu Maesaka, and Michihiro Murata, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 19, 1988, Ser. No. 145,530
Claims priority, application Japan, Jan. 21, 1987, 62-12972
Int. Cl.[4] H01G *9/00*
U.S. Cl. 361—502 **13 Claims**



1. An electric double-layer capacitor having one or more electric double-layer capacitor elements,

each of said electric double-layer capacitor elements including:

a charge storage part;

a pair of collectors arranged to hold said charge storage part, each of said collectors having a multi-layer structure including a plurality of conductive polyethylene layers provided with conductivity by a carbon material, said polyethylene layers comprising respective polyethylene materials having different density levels; and

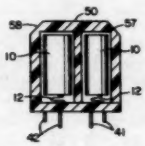
a gasket enclosing said charge storage part and being arranged between and adhered to said collectors.

4,803,598

ELECTROLYTIC CAPACITOR ASSEMBLY

Thomas W. Efford, and Lester C. Dain, both of West Jefferson, N.C., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jan. 19, 1988, Ser. No. 145,440
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—541 5 Claims



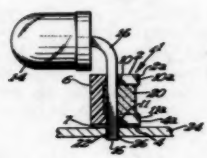
1. An electrolytic capacitor assembly comprising a plurality of tab-wound capacitor sections, each of said sections having at least one electrode tab connected to one electrode foil and extending from said section, at least one other electrode tab connected to another electrode foil and extending from said section, a rectangular parallelepiped case having an insulating cover and an insulating base, a conductive termination attached at one end to each of said tabs and passing out of said case through said base, at least one vertical wall inside said case dividing said case interiorly into isolated chambers, each of said chambers containing one of said sections, at least one vent located in said cover at a junction of a top surface of said cover and a side wall of said cover parallel to said vertical wall, whereby under internal pressure said side wall parts as a smooth gap from said top surface, said cover being sealed to said base including an edge of said vertical wall being sealed to said base.

4,803,599

MOUNTING BAR STRUCTURE FOR ELECTRICAL SIGNALLING AND INDICATING DEVICES

John A. Trine, Lake Elmo, and Daryle L. Petersen, Eagan, both of Minn., assignors to Wilbrecht Electronics, Inc., St. Paul, Minn.

Filed Nov. 6, 1987, Ser. No. 118,199
Int. Cl.[4] F21V 21/00
U.S. Cl. 362—249 13 Claims



1. An indicator light assembly comprising:

an elongated mounting bar having planar wall means extending longitudinally thereof;

a plurality of apertures extending through said wall means at predetermined locations along the length of said bar;

a plurality of indicator lights supported on said mounting bar at predetermined, spaced-apart locations thereon as defined by said apertures, each of said indicator lights having a plurality of electrical connector leads attached thereto and extending therefrom in the same direction whereby each indicator light is freely suspended along one end of a pair of said leads, and said apertures being arranged in laterally adjacent sets, with the rest of leads for each indicator light being contained within a set of said apertures to extend in a direction generally perpendicular to the longitudinal direction of extent of said wall means at a desired position of adjustment along said lead direction, with each of said indicator light being freely supported at a desired height a predetermined displacement distance from said planar wall means only along said one end of a pair of said leads;

means securing each of said connector leads within said apertures and affixing said leads to said mounting bar only along the opposite ends thereof from said one end, with a predetermined lead portion opposite said one end thereof being exposed for connection to an electrical contact means; and

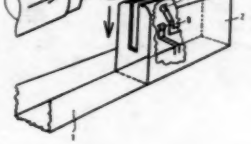
each of said connector leads being made of conductive metal which is malleable and bendable, yet rigid enough to be self-supporting and to hold any position to which it is bent, whereby the lengths of said leads projecting outwardly from said mounting bar between said mounting bar and said indicator lights may be bent to any desired angle or configuration so as to orient each of said indicator lights in a predetermined, desired position.

4,803,600

LUMINAIRE FOR A ROD-SHAPED FLUORESCENT LAMP

Franz Pepping, Pulheim, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 14, 1988, Ser. No. 143,896
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708762
Int. Cl.[4] F21S 3/00
U.S. Cl. 362—217 16 Claims



1. A luminaire for a rod-shaped fluorescent lamp provided with pin bases at both ends and having an elongated support profile whose width is only slightly larger or smaller than the diameter of the lamp envelope and which at both ends has sockets provided with contacts each having a groove to accommodate the base pins when inserting the lamp in an axially parallel manner, characterized in that intermediate members of an insulating material are arranged on the lamp bases, the rear side of each member being provided with a cross limb extending parallel to the base pins and being formed in such a manner that the individual base pins are located on different sides of the cross limb which, when inserting the lamp in the luminaire, engages the groove of a socket in a lock-tight manner, whereby the base pins come into contact with the socket contacts.

4,803,601

MOTOR VEHICLE HEADLIGHT, SUITABLE FOR EMITTING A BEAM LIMITED BY A CUT-OFF, AND INCLUDING A MODIFIED REAR PORTION

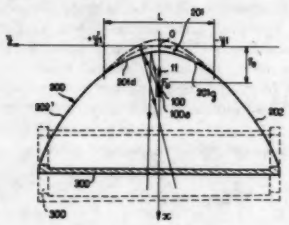
Patrice Collot, Pantin, and Bernard Luciani, Paris, both of France, assignors to Cibie Projecteurs, France

Filed Dec. 31, 1987, Ser. No. 140,241

Claims priority, application France, Dec. 30, 1986, 86 18341; Dec. 30, 1986, 86 18342

Int. Cl.[4] F21V *7/00*

U.S. Cl. 362—80 **18 Claims**



1. A motor vehicle headlight of the type suitable for emitting at least one beam that is delimited by a top cut-off and that includes an approximately central concentration spot, the headlight comprising: a filament lamp; a reflector; and an enclosure glass; the headlight including the improvements whereby said reflector comprises:

at least two lateral zones that form small images of the filament defining said concentration spot and forming said cut-off; and

a central zone which reflects the light rays emitted by the filament to cause them to converge in a region at a substantial distance from the closure glass while simultaneously forming large filament images which are spread out below said cut-off;

with said lateral zones and said central zone joining one another with second order continuity in two essentially vertical planes that are parallel to a central optical axis of the headlight and are disposed on either side thereof.

4,803,602

SUN VISOR WITH ILLUMINATED MIRROR

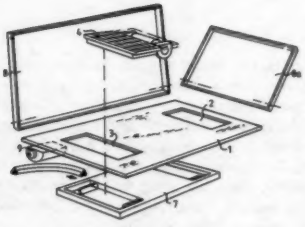
E. Gunnar Svensson, Malung, Sweden, assignor to Autopart Sweden AB, Malung, Sweden

Filed Oct. 14, 1987, Ser. No. 108,012

Claims priority, application Sweden, Oct. 24, 1986, 8604556

Int. Cl.[4] F21V *33/00*

U.S. Cl. 362—135 **5 Claims**



1. An illuminated frameless mirror for a vehicle sun visor, comprising

(a) a self supporting planar mirror plate having a reflective surface and containing at least one opening;

(b) a unitary illumination device arranged in said mirror plate opening and removably connected therewith, said illumination device including

(1) a lamp holder containing an illumination lamp;

(2) a prism arranged adjacent the lamp of said lamp holder, the light from said illumination lamp being transmitted from said illumination unit via said prism to provide indirect illumination to the user; and

(c) electrical contact means connected with said illumination unit for supplying electrical energy to said illumination lamp.

4,803,603

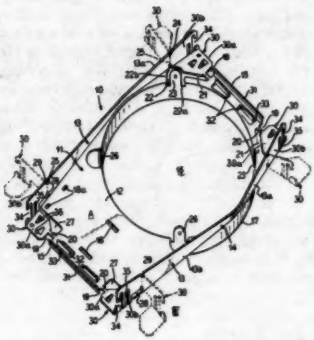
PLASTER FRAME

Douglas W. Carson, Downey, Calif., assignor to Thomas Industries, Inc., Los Angeles, Calif.

Filed Feb. 16, 1988, Ser. No. 156,324

Int. Cl.[4] F21S *1/02*

U.S. Cl. 362—150 **18 Claims**



1. A plaster frame for recessed lighting fixtures which comprises a flat metal plate, an aperture through the plate, a collar depending from the aperture, and bendable corners on the plate swingable from axial to transverse positions and constructed and arranged to receive hanger bars for mounting the frame in axial and perpendicular orientations between joists.

4,803,604

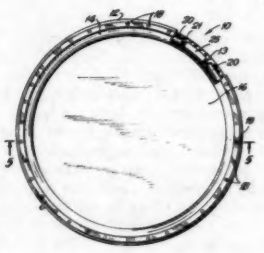
ILLUMINATED SERVING TRAY

Nancie L. Nichols, c/o James Berman, 204 E. 63rd St., New York, N.Y. 10021, and Bjorn Svensen, Pingvinveien 4, 3200 Sandefjord, Norway

Filed Feb. 26, 1988, Ser. No. 161,086

Int. Cl.[4] F21V *33/00*

U.S. Cl. 362—154 **15 Claims**



1. An illuminated serving tray comprising:

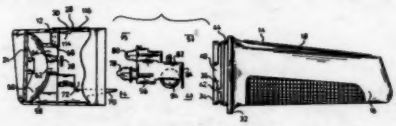
a tray housing having a peripheral rim;
a substantially flat serving surface recessed within said rim;
a light means positioned on said rim such that the light from said light means is visible from both above and below said illuminated tray and such that said light illuminates said serving surface; and
self-contained means for energizing said light means, said energizing means being positioned in a manner that is substantially symmetric with respect to the center of said tray such that the illuminated tray is balanced about any diameter.

4,803,605

FLASHLIGHT WITH A BACKUP SYSTEM

David R. Schaller, Janesville; El-Sayed Megahed, Madison; James Neyer, Middleton, all of Wis., and Tor Petterson, Palos Verdes Peninsula, Calif., assignors to Rayovac Corporation, Madison, Wis.

Filed Aug. 4, 1987, Ser. No. 81,655
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—184 **20 Claims**



1. A hand-held flashlight comprising:
a flashlight head with a transparent lens and sidewalls defining a first cavity;
a flashlight body with at least one longitudinal wall and a second cavity;
housing interconnecting means for interconnecting said body and head to form a common enclosure;
a primary electrical system disposed in said enclosure for generating a primary beam through said lens;
a backup electrical system disposed in said enclosure and separate from said primary electrical system for generating a backup light beam through said lens, said backup electrical system comprising a backup battery disposed in said first cavity; and
activation means for selectively activating said primary and backup systems.

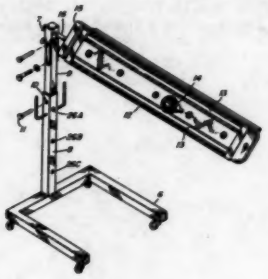
4,803,606

MOBILE UNIVERSAL SHOP LIGHT

Karl Rotter, 116 Pinecrest Dr., Dartmouth, N.S., Canada (B3A 2J9)

Filed Jul. 14, 1987, Ser. No. 73,110
Claims priority, application Canada, Jun. 19, 1987, 540158
Int. Cl.[4] F21V *21/22, 21/26*
U.S. Cl. 362—250 **11 Claims**

1. A mobile shop light comprising a lower stand mounted on means to provide mobility, a lower stand bar rigidly attached to the lower stand and which extends upward from the lower stand in a direction perpendicular to the plane of the lower stand, an upper stand bar which telescopes into the lower stand bar so as to allow the upper end of the upper stand bar to be positioned at different heights, means to secure the upper stand bar in position relative to the lower stand bar, attaching means connected to the upper end of the upper stand bar which adjustably attaches to the upper stand bar an elongated light fixture containing illuminating means and power supply means, said attaching means allowing the fixture to rotate about its longitudinal axis and to be positioned with its longitudinal axis perpendicular to the upper stand bar and at intermediate angles to the perpendicular; and
the attaching means is comprised of a body with two parallel flanges disposed from the body being rotatably attached to the upper stand bar, the fixture rotatably attached to the main body, the main body constrained to rotate about a



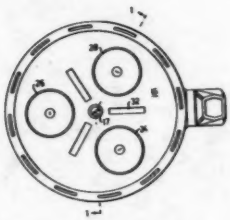
centre and being fixed in various positions by means of pinning through holes located in flanges connected to the upper stand bar.

4,803,607

SURGICAL OPERATING ROOM LAMP OR SIMILAR LAMP

Stig Jönsson, Blomstermala, Sweden, assignor to Landstingens inkopscentral LIC, ekonomisk forening, Solna, Sweden

PCT No. PCT/SE87/00251, § 371 Date Jan. 19, 1988, § 102(e) Date Jan. 19, 1988, PCT Pub. No. WO87/07354, PCT Pub. Date Dec. 3, 1987
PCT Filed May 20, 1987, Ser. No. 143,554
Claims priority, application Sweden, May 20, 1986, 8602278
Int. Cl.[4] F21V *11/14*
U.S. Cl. 362—250 **3 Claims**



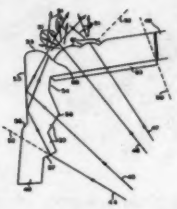
1. Surgical operating room lamp comprising a lamp housing supporting at least three reflectors associated each with at least one bulb or similar lamp and being angularly adjustable to focus the light beams to a predetermined area along the central optical axis of the lamp housing, the reflectors being spaced equally around the optical axis, characterized in that the reflectors (24,26,28) and their bulbs are supported by a flexible diaphragm member (16) mounted in the lamp housing with its peripheral edge resting against a shoulder (14) or similar abutment; and that the diaphragm member is supported at its center by an axially adjustable control device (20,22) to displace the center of the diaphragm member away from the open end of the lamp housing to set those portions of the diaphragm member supporting the reflectors at the same angle to the optical axis thereby adjusting the angular position of all reflectors simultaneously.

4,803,608

REAR LIGHTS FOR BICYCLES AND OTHER VEHICLES

Nigel J. R. Dashwood, Hertfordshire, England, assignor to Duracell Inc., Bethel, Conn.

Filed Dec. 18, 1986, Ser. No. 944,151
Claims priority, application United Kingdom, Dec. 19, 1985, 8531275
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—72 4 Claims



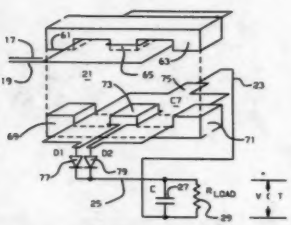
1. A light comprising a lamp, means defining an optical axis close to which the major part of the emergent light is distributed and a lens system having formed on its nearer face to the lamp one or more prisms adjacent an edge thereof and being arranged to trap direct light from the lamp and distribute it by total internal reflection through the material of said lens system so that it emerges from the edge at more than 100° to the optical axis.

4,803,609

D. C. TO D. C. CONVERTER

John B. Gillett, Woodstock, and James H. Spreen, Stone Ridge, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 81,401, Aug. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 793,520, Oct. 31, 1985, abandoned. This application May 2, 1988, Ser. No. 191,822
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—17 6 Claims



1. A combined power transformer/output filter inductor structure comprising, in combination,

a core of magnetic material with two closed flux paths sharing a common segment,

a secondary structure,

said secondary structure comprising a first and second conducting path joined at a common node,

said first and second conducting paths being connected to an external circuit via terminals, which define said first and second conducting paths,

a first of said terminals connected to said common node,

second and third of said terminals connected to the respective ends of said secondary structure but remote from said common node whereby current flow through said secondary conducting paths in the same direction to or from said common node generates opposing magnetomotive forces in said common segment of said two closed flux paths, and

a primary conducting path connected to an external circuit via two terminals, the turns of said primary conducting path additively produce flux in said common segment of said flux path,

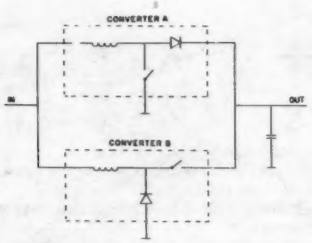
said primary and secondary conducting paths being positioned in close physical proximity to provide tight magnetic coupling between said primary conducting path and said secondary structure while simultaneously providing significantly weaker magnetic coupling between said primary conducting path and each of said secondary conducting paths taken individually.

4,803,610

SWITCHING POWER SUPPLY

Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Filed Apr. 7, 1987, Ser. No. 35,479
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 3611556
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—70 20 Claims



1. Switching power supply, for converting an input signal into an output signal, comprising:

a pair of switching converter means each having an input and output terminals, and a reference terminal being coupled to ground;

the input terminal of each switching converter means being coupled to the output terminal of the remaining switching converter means; and

a capacitor being coupled to ground;

one of the converter means having the input terminal coupled to receive the input signal and the output terminal coupled to the capacitor with the output signal of the switching power supply appearing thereacross.

4,803,611

APPARATUS FOR CORRECTING DC COMPONENT OF OUTPUT VOLTAGE IN INVERTER

Nobuo Sashida, and Yushin Yamamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

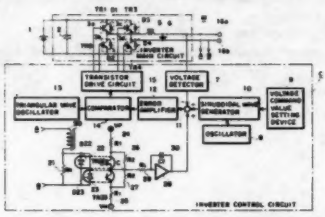
Filed Oct. 14, 1987, Ser. No. 108,126
Claims priority, application Japan, Feb. 12, 1987, 62-28353
Int. Cl.[4] H02P *13/20;* H02M *1/12*
U.S. Cl. 363—98 4 Claims

1. Apparatus for correcting a DC component of an output voltage in an inverter, wherein a DC power source is converted into AC voltage by an inverter main circuit, the output voltage of the inverter main circuit is detected by a voltage detector, and an input signal to correct the DC component is outputted through an inverter control circuit to the inverter main circuit,

said apparatus being provided in the inverter control circuit with:

current detecting means connected in parallel to output of the inverter main circuit; and

polarity discrimination means for automatically discriminating polarity of current flowing through the current detecting means and for supplying the inverter control circuit with said DC component correcting signal;



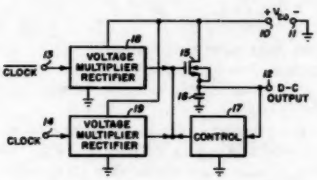
said current detecting means being constituted by a saturable reactor connected to one output end of the inverter main circuit.

4,803,612

CLOCK RIPPLE REDUCTION IN A LINEAR LOW DROPOUT C/DMOS REGULATOR

Timothy J. Skovmand, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 8, 1988, Ser. No. 203,966
Int. Cl.[4] G05F *1/56*
U.S. Cl. 323—284 **4 Claims**



1. A C/DMOS voltage regulator connectable to a source of operating power and to a source of clock pulses for producing a regulated d-c output, said voltage regulator comprising:

a DMOS pass transistor having a gate electrode, its drain electrode coupled to said source of operating power and its source electrode providing said regulated d-c output;

a first voltage multiplier rectifier having an input coupled to receive said source of clock pulses and an output coupled to said gate of said DMOS transistor;

a second voltage multiplier rectifier having an input coupled to receive the complement of said source of clock pulses and an output coupled to said gate of said DMOS transistor; and

a control circuit responsive to said d-c output and operative to control the potential of said gate of said DMOS transistor.

4,803,613

DECENTRALIZED MASTER-SLAVE CONTROL APPARATUS

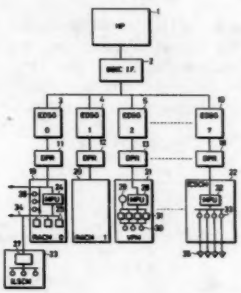
Masatsugu Kametani, Ibaraki; Kengo Sugiyama, Abiko; Takashi Kogawa, Sakura, and Takeshi Hanada, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 7, 1986, Ser. No. 860,430
Claims priority, application Japan, May 10, 1985, 60-97701
Int. Cl.[4] G06F *15/46, 15/16, 9/40*
U.S. Cl. 364—132 **20 Claims**

1. A control apparatus for controlling a controlled object which includes a plurality of controlled elements, comprising:

a host processor for supervising said control apparatus and for interpreting successive steps of subprograms included within a control program to generate commands for the control of said controlled elements in response to respective demand signals, each command including first designation information for designating a subprogram to be processed after the execution of said each command;

a plurality of slave modules each slave module being allotted to one of said controlled elements, respectively, and includes a processor for interpreting and executing said



commands to generate control signals for said allotted controlled element and for generating, upon completion of the execution of said each command, a demand signal for requesting said host processor to generator another one of said commands, said demand signal includes second designation information for designating a subprogram to the processed in said host processor; and

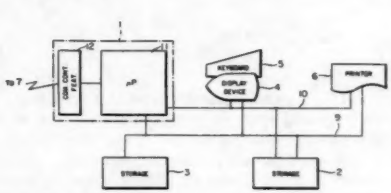
communication means for transmitting said demand signals from said slave modules to said host processor and said commands from said host processor to said slave modules.

4,803,614

SYSTEM FOR RETRIEVING DISTRIBUTED INFORMATION IN A DATA BASE

Fumiyasu Banba, Hadano, and Yoshinori Okami, Odawara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1986, Ser. No. 828,342
Claims priority, application Japan, Feb. 21, 1985, 60-33447
Int. Cl.[4] G06F *12/00, 12/08, 12/02, 12/10*
U.S. Cl. 364—200 **13 Claims**



7. An information retrieval system in which a plurality of data keys are assigned respectively to each of a plurality of stored retrieval data for identifying each stored retrieval data and in which a retrieval condition for retrieving said data keys is inputted to obtain a predetermined stored retrieval data satisfying said retrieval condition, so that the obtained retrieval data is outputted for visual display, comprising:

a central computer including;

first storage means for storing a set of said data keys,

retrieving means, connected to said first storage means, for retrieving from said first storage means a data key satisfying said retrieval condition, and

means, connected to said retrieving means, for transmitting said retrieved data key to a terminal device; and

said terminal device including;

second storage means for storing a set of said retrieval data as a image file;

input means for inputting said retrieval condition;

transceiving means, connected to said input means, for transmitting to said central computer said retrieval condition inputted from said input means and for receiving said data key retrieved by and transmitted from said central computer;

means, connected to said second storage means, for extracting from said second storage means said predetermined retrieval data specified by said data key; and

means for outputting said predetermined retrieval data extracted from said second storage means for visual display.

4,803,615

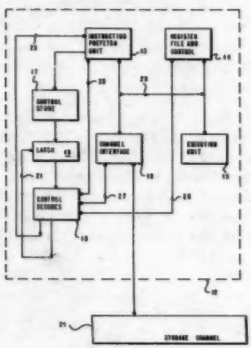
MICROCODE CONTROL OF A PARALLEL ARCHITECTURE MICROPROCESSOR

William M. Johnson, Leander, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 666,789, Oct. 31, 1984, abandoned. This application Jun. 8, 1987, Ser. No. 59,167

Int. Cl.[4] G06F 9/22

U.S. Cl. 364—200 **6 Claims**



1. A microprogrammed parallel processor including a plurality of processing units, operable under control of microinstructions each containing a plurality of micro-operations, said microprogrammed parallel processor comprising:

means for executing, during a cycle, each of said plurality of micro-operations, within a microinstruction, for which a required processing unit is available;

means connected to said executing means for indicating which micro-operations were not executed during the cycle;

means, connected to said executing means and said indicating means for recycling only those micro-operations within said microinstruction for which said indicating means indicated as not executed during the cycle, for execution by said executing means in a subsequent cycle as each required processing unit becomes available; and

means, connected to said means for recycling, for storing said microinstruction until all of said plurality of micro-operations within said microinstruction are executed.

4,803,616

BUFFER MEMORY

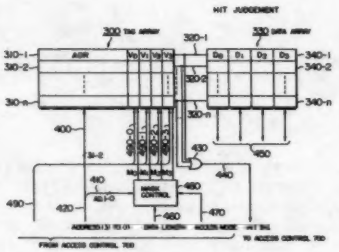
Kunio Uchiyama, Hachioji; Tadahiko Nishimukai, Sagamihara, and Atsushi Hasegawa, Koganei, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Eng. Ltd., both of Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 781,512

Claims priority, application Japan, Oct. 1, 1984, 59-204179

Int. Cl.[4] G06F 13/00, 12/06

U.S. Cl. 364—200 **4 Claims**



1. A buffer memory system comprising:

(1) a data array having a plurality of word lines, and means for storing a plurality of data blocks on each of said plurality of word lines;

(2) a tag array having a plurality of word coincidence lines each of which is connected to a respective one of said plurality of word lines of said data array, said tag array having a first area which stores upper bits of address data of one of a plurality of data blocks in a main memory, said first area having first means for selecting one of said plurality of word coincidence lines so as to read out at least one of said plurality of data blocks from one of said plurality of word lines corresponding to said selected one of said plurality of word coincidence lines, and said tag array having a second area which stores a plurality of validity flags along each of said plurality of word coincidence lines, each of said plurality of validity flags along each respective one of said plurality of word coincidence lines corresponding to a respective one of said plurality of data blocks along the respective word line of said data array and means for searching the first and second areas to detect coincidence between said stored upper bits and an address signal supplied as a search input;

(3) mask control means responsive to lower bits of said address signal as well as to a data length signal indicating the length of data blocks to be read out from said array for generating a plurality of mask signals, each mask signal indicating whether a corresponding validity flag in each word coincidence line is to be used or not used as a search object by said searching means, said plurality of mask signals being supplied to said second area of said tag array to mask said validity flags selectively; and

(4) hit judgement means having a plurality of inputs which are connected to said plurality of word coincidence lines of said tag array, said hit judgement means including means for generating a hit signal indicating that a requested data is present in said data array when coincidence is detected by said searching means.

4,803,617

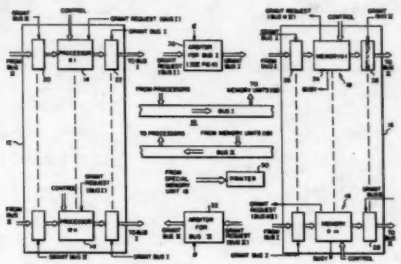
MULTI-PROCESSOR USING SHARED BUSES

Thomas N. Berarducci, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 827,565, Feb. 10, 1986, abandoned. This application Mar. 3, 1988, Ser. No. 166,756

Int. Cl.[4] G06F *13/40, 13/14, 15/16*

U.S. Cl. 364—200 **1 Claim**



1. Multi-processor apparatus for processing digital image data in accordance with digital image processing algorithms and delivering an enhanced digital image to an image printer, comprising:

a. an array of separately addressable memory units for storing a digital image, each including input and output data storage means, each memory unit providing a request signal when it is ready to transfer digital image data and a particular address indicating where image data are to be transferred, a particular memory unit being adapted to deliver an enhanced digital image to such printer;

b. an array of individually addressable processor which operate in accordance with stored algorithms to enhance a digital image, each including input and output data storage means, and address decoding means, each processor providing a request signal when it is ready to transfer digital image data to a particular memory unit;

c. a first unidirectional data bus connected to said memory units and said processors for transferring digital image data from a selected one of the output data storage means of a particular processor to a selected one of the input data storage means of a particular memory unit;

d. a second unidirectional data bus connected to said memory units and said processors for transferring digital image data from a selected one of the output data storage means of a particular memory unit to a selected one of the input data storage means of a particular processor after its decoding means decodes its particular address; and

e. data transfer controller means including a first arbitor circuit responsive to all the processor request signals for controlling the transfer of digital image data on said first bus and a second arbitor circuit independent of said first arbitor circuit and responsive to all the memory unit request signals for controlling the transfer of digital image data on said second bus.

4,803,618

MULTIPROCESSOR SYSTEM HAVING COMMON MEMORY

Noboru Ita, and Shigeru Mitsugi, both of Yamato, Japan, assignors to Panafacom Limited, Kanagawa, Japan

Filed Jan. 17, 1986, Ser. No. 819,658

Claims priority, application Japan, Jan. 19, 1985, 60-008073

Int. Cl.[4] G06F *15/16, 13/00*

U.S. Cl. 364—200 **10 Claims**

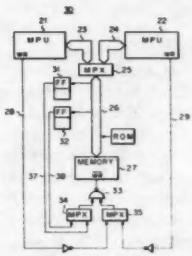
1. A multiprocessor system comprising:

(a) a plurality of processors, one of the processors to be operated as a master processor, the remaining processors being slave processors, said plurality of processors producing at least write request signals;

(b) a common memory to be accessed by the plurality of processors one by one in a time division control mode by a time division data bus;

(c) a first means for storing therein a write permission flag from the master processor through the time division data bus, the write permission flag being allotted to each of the processors by the master processor;

(d) a second means for receiving both the write permission flag from the first means and write request signals issued



from the plurality of processors through the time division control bus, the second means producing a write enable signal to be applied to the common memory for activating the same, if the write permission flag from the master processor and the write request signal from one of the processors are generated simultaneously; and

(e) a third means for determining timing for providing said write enable signal to the common memory, under the time division control mode, pertaining to each of the plurality of processors wherein said slave processors being inhibited only from a write operation to the common memory during an initial program load.

4,803,619

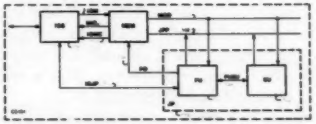
DIGITAL DATA PROCESSING SYSTEM INCORPORATING APPARATUS FOR RESOLVING NAMES

David H. Bernstein, 41 Bay Colony Dr., Ashland, Mass. 01721; Walter A. Wallach, 1336 Medfield Rd., Raleigh, N.C. 27607; Michael S. Richmond, Fearrington Post Box, Pittsboro, N.C. 27312; John K. Ahlstrom, 1309 San Domar, Mountain View, Calif. 94043; John F. Pilat, 1308 Ravenhurst Dr., Raleigh, N.C. 27609; David A. Farber, 1700 Lakewood Ave., Durham, N.C. 27707; Richard A. Belgard, 21250 Glenmont Dr., Saratoga, Calif. 95070, and Richard G. Bratt, 9 Brook Trail Rd., Wayland, Mass. 01778

Continuation of Ser. No. 589,401, Mar. 15, 1984, abandoned, which is a continuation of Ser. No. 266,533, May 22, 1981, abandoned. This application Jun. 20, 1986, Ser. No. 877,699

Int. Cl.[4] G06F *13/00, 09/00*

U.S. Cl. 364—200 **17 Claims**



1. In a digital computer system including

(1) processor means for performing operations on data items by executing procedures of data items containing instruc-

tions by responding to the instructions contained in each said procedure when executing said procedure, and

(2) memory means for storing said data items and providing said data items to said processor means in response to memory signals from said processor means,

and wherein

each of said memory signals derived from a descriptor including at least an address of one of said data items in said memory means, and said data items further include

(a) a plurality of process data items, each process data item being associated with the execution of specified procedures, and including

(i) one or more frames of said process data items, each frame corresponding to the execution of one of said specified procedures, and

(ii) a static data area of said process data items which are not associated with the execution of any specified procedure and further including

means for deriving certain of said addresses in said descriptors by using a plurality of architectural base addresses which are contained in a region of said memory means associated with the procedure which said processor means is currently executing, said plurality of architectural base addresses including

(a) a frame address from which locations in the frame associated with the currently executed procedure are calculated,

(b) a static data area address from which locations in the static data area associated with the currently executed procedure are calculated, and

(c) a procedure address from which locations in the procedure currently being executed are calculated,

means for performing a call operation suspending the execution of a current procedure and commencing the execution of another procedure and means for performing a return operation terminating the execution of said other procedure and resuming the execution of the suspended procedure, said call operation performing means including,

(a) means for saving the plurality of architectural base addresses associated with the execution of the current procedure and a program counter value specifying the next instruction to be executed in said current procedure when said call operation occurs,

(b) means for locating a region of said memory means associated with a procedure whose execution is being commenced by said call operation,

(c) means for obtaining a plurality of architectural base addresses from the region of said memory means associated with the procedure whose execution is being commenced by said call operation, and

(d) means for obtaining a program counter value for the first instruction in the procedure whose execution is being commenced by said call operation and commencing the execution of said procedure using the plurality of architectual base addresses associated with the procedure whose execution is being commenced in order to obtain the instructions for said procedure; and

said return operation performing means including,

means for restoring the saved plurality of architectural base addresses associated with the procedure whose execution is being resumed and the program counter value specifying the next instruction to be executed when the execution of the procedure which was suspended by said call instruction is resumed and resuming the execution of said suspended procedure containing the next instruction using said saved architectural base addresses.

4,803,620

MULTI-PROCESSOR SYSTEM RESPONSIVE TO PAUSE AND PAUSE CLEARING INSTRUCTIONS FOR INSTRUCTION EXECUTION CONTROL

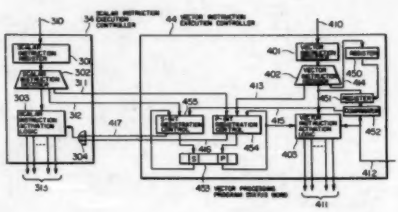
Yasuhiro Inagami, Kodaira; Takayuki Nakagawa, Kokubunji, and Shigeo Nagashima, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 5, 1987, Ser. No. 445

Claims priority, application Japan, Jan. 8, 1986, 61-563

Int. Cl.[4] G06F *9/30, 15/16*

U.S. Cl. 364—200 **9 Claims**



1. A multi-processor system comprising a first processor and a second processor connected to said first processor for supplying said first processor with data required for execution of instructions by said first processor;

said first processor including a first instruction register for holding an instruction to be executed thereby; first decoding means connected to said first instruction register for decoding the instruction held by said first instruction register; first activation control means connected to said first decoding means for controlling activation of the decoded instruction; indication means connected to said activation control means for indicating thereto an operation state of said first processor;

a registration control means connected to respond to decoding of a pause instruction by said first decoding means for setting at said indication means a pause indication indicating that said first processor is in a pause state;

said first activating control means including means connected to respond to said pause indication for suspending activation of a succeeding instruction decoded after the pause instruction so long as said pause indication is issued by said indication means;

said second processor including a second instruction register for holding an instruction to be executed thereby; second decoding means connected to said second instruction register for decoding the instruction held by said second instruction register; and second activation control means connected to said second decoding means for controlling activation of the instruction decoded by said second decoding means;

said registration control means including means connected to said second decoding means and responsive to decoding of a pause clearing instruction by said second decoding means and to indication of a pause state by said indication means for resetting said pause indication and for supplying to said second activation control means a completion signal indicating that said pause indication has been reset and responsive to the decoding of a pause clearing instruction and to indication of a non-pause state by said indication means for supplying to said second activation control means an incompletion signal; and

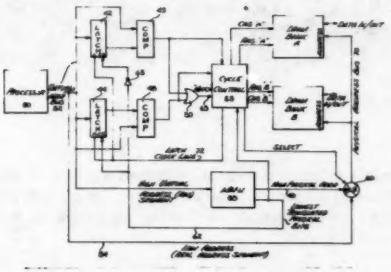
said second activation control means including means responsive to said incompletion signal for suspending activation of a succeeding instruction decoded after decoding of the pause clearing instruction by said second decoding means until said completion signal is received by said second activation control means.

4,803,621

MEMORY ACCESS SYSTEM

Edmund J. Kelly, San Jose, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jul. 24, 1986, Ser. No. 890,075
Int. Cl.[4] G06F *13/00*; G11C *7/00*
U.S. Cl. 364—200 15 Claims



1. A memory access system comprising:

memory means for storing data, said memory means including N banks of memory arrays, each of said memory arrays comprising a dynamic random access memory having static column access, wherein data is stored at a plurality of locations, each of said locations specified by a real row address and a column address and wherein said data at said specified location is accessed after receipt of said real row address followed by a row address strobe (RAS) signal and said column address followed by a column address strobe (CAS) signal;

address generation means for generating a virtual row address and said column address corresponding to a desired data location in one of said memory arrays, said address generation means comprising a processor;

latch means electrically connected to said address generation means, said latch means including N latches, one for each of said N banks of memory arrays, for receiving said virtual row address and storing said virtual row address upon receipt of a clock signal;

comparator means electrically connected to said latch means and said address generation means, said comparator means including N comparators, one for each of said N banks of memory arrays, for comparing a current virtual row address from said address generation means to a preceding virtual row address currently stored in said latch means and for providing an output indicating the results of said comparison, said comparator means further including an OR gate for receiving the outputs of said comparators and providing an output;

a memory management unit (MMU) for translating said virtual row address into a real row address;

cycle control means electrically connected to said output of said OR gate, said latch means, said MMU, and said memory means for receiving said comparator output and for providing said real row and column addresses and said RAS and CAS signals to said one memory array, wherein said real row address and said RAS signal are provided to said one memory array only if said comparator output indicates that said current virtual row address is not the same as said preceding virtual row address, and wherein only said column address and said CAS signal are provided to said one memory array when said comparator output indicates that said current virtual row address is the same as said preceding virtual row address;

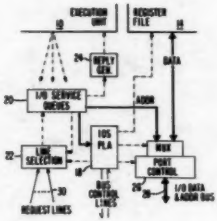
said cycle control means including clock means for providing said clock signal when said comparator output indicates that said current virtual row address is not the same as said preceding virtual row address.

4,803,622

PROGRAMMABLE I/O SEQUENCER FOR USE IN AN I/O PROCESSOR

William L. Bain, Jr., Beaverton; Robert C. Bedichek, Hillsboro; George W. Cox, Portland, all of Oreg.; Gerhard Grassl, Land Bayern, Fed. Rep. of Germany; Craig B. Peterson, Portland, Oreg.; Justin R. Rattner, Beaverton, Oreg.; Gurbir Singh, Portland, Oreg.; Gurbir Singh, Portland, Oreg., and John L. Wipfli, Hillsboro, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed May 7, 1987, Ser. No. 46,633
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 3 Claims



1. In a data processing system having I/O devices connected to an I/O bus, a register file (14), and an Execution Unit (EU-10) which executes a plurality of tasks comprised of a sequence of instructions;

said tasks including a sending task and a destination task;

a bus sequencer (12) for providing a data path between said devices and said register file (14), comprising:

PLA means (18) for storing a program;

service table means (20) connected to said PLA means, said service table means including a plurality of service table entries divided into service table fields (FIG. 5), one of said service table fields (IOS command) containing means for instructing said PLA as to what kind of operation said bus sequencer is to perform;

a plurality of I/O request lines (30);

line selection logic means (22) connected to said I/O request lines (30), to said PLA means (18), and to said service table means (20) for determining which service table entry said PLA means is to use; and,

bus interface means (26) connected to said I/O bus (28), said register file (14), and to said PLA means (18) for routing data between said register file (14) and said I/O bus (28);

each one of said service table fields further including first and second register-set descriptors (Table section A, table section B, FIG. 5), each register set descriptor including means for storing first bits (data pointer) which identify a register set buffer in said register file (14) and second bits indicative of the status of said register set buffer,

said PLA (18) including means for decoding an ACCESS instruction to start an operation by loading said first and second bits of said first register-set descriptor, and means for decoding a first SUPPLY instruction of sequential SUPPLY instructions to continue said operation by loading said first and second bits of said second register-set descriptor,

each subsequent SUPPLY instruction being decoded by said PLA to continue said operation by loading said first and second bits of whichever one of said first and second register-set descriptors corresponds to an empty register set buffer.

4,803,623

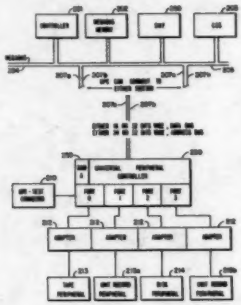
UNIVERSAL PERIPHERAL CONTROLLER SELF-CONFIGURING BOOTLOADABLE RAMWARE

John A. Klashka, North Andover; Sidney L. Kaufman, Stoughton; Krzysztof A. Kowal, Framingham, all of Mass.; Richard P. Lewis, Sandown, N.H.; Susan L. Raisbeck, Chelmsford, and John L. McNamara, Jr., Tewksbury, both of Mass., assignors to Honeywell Bull Inc., Minneapolis, Minn.

Filed Oct. 31, 1986, Ser. No. 925,431

Int. Cl.[4] G06F *13/10*

U.S. Cl. 364—200 **15 Claims**



1. A computer peripheral controller system having at least a system bus, at least a control subsystem (CSS), said CSS also including an erasable programmable memory (EPROM), and at least one random access memory (RAM) all coupled to the system bus, said computer peripheral controller system for controlling different types of peripheral devices (e.g. tape drives, disk drives, diskette drives, unit record drives, printers, etc.) coupled to said system bus, said peripheral computer system controller comprising:

(a) adapter means coupled to said computer peripheral controller for coupling said peripheral devices to said system bus;

(b) processor means coupled to said computer peripheral controller for controlling access to said system bus;

(c) Ramware means in one of said peripheral devices for providing at least one configuration of peripheral devices for coupling to said system bus, from a plurality of configurations of peripheral devices capable of being coupled to said system bus;

(d) utility loading means for automatically loading said Ramware means from one of said peripheral devices into said RAM; and,

(e) instruction means in said computer peripheral controller system for servicing said configuration of peripheral devices coupled to said system bus.

4,803,624

ELECTRON SPIN RESONANCE SPECTROMETER

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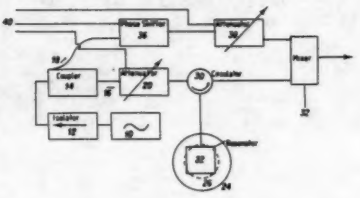
Filed Jul. 14, 1987, Ser. No. 73,213

Claims priority, application Australia, Sep. 19, 1986, PH08127

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—316 **22 Claims**

1. An electron spin resonance spectrometer for analyzing and determining at least one property of a sample, said spectrometer comprising a microwave source for providing microwave radiation to a sample arm and to a reference arm, said sample arm having a first circulator for directing the radiation to a resonator in which the sample for analysis is deposited and for receiving the radiation from said resonator and directing the radiation to a detector, said detector detecting the radiation



from said sample arm and said reference arm to determine the property or properties of the sample, said sample arm and said reference arm being formed as an integrated microwave bridge.

4,803,625

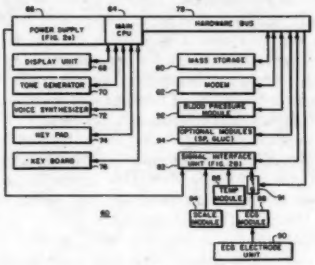
PERSONAL HEALTH MONITOR

Ping W. Fu, Des Plaines, and Thomas J. Manning, Chicago, both of Ill., assignors to Buddy Systems, Inc., Northbrook, Ill.

Filed Jun. 30, 1986, Ser. No. 879,900

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—413.03 **30 Claims**



1. A personal health monitor comprising:

means for determining a plurality of health parameters, each indicative of the physical condition of a patient;

means for prompting the patient with selected messages;

means for storing a prescribed parameter schedule for selected ones of the health parameters;

means for storing a prescribed medication schedule for at least one medication;

first means for automatically controlling the prompting means to request the patient to use the determining means to determine selected ones of the health parameters in accordance with the prescribed parameter schedule and for automatically storing the determined health parameters in a composite log;

second means for automatically controlling the prompting means to request the patient to take medication in accordance with the prescribed medication schedule;

means for automatically recording in the composite log information indicative of patient compliance with the prescribed medication schedule; and

means for automatically transmitting the composite log to a central location for analysis by trained medical personnel;

said composite log providing information indicative of both the determined health parameters and patient compliance with the prescribed medication schedule at the central

location, thereby assisting the trained medical personnel in assessing the health of the patient.

7. A personal health monitor adapted to be powered by an alternating circuit power source, said monitor comprising:

means for collecting information indicative of the physical condition of a patient;

means for recording the collected information; and

means for supplying a DC supply voltage to power the collecting means and the recording means, said supplying means comprising:

a rechargeable battery connected to the collecting means and the recording means;

a battery charger adapted for connection to the alternating circuit power source and comprising means for supplying a charging current to the battery;

a switch positioned to interrupt the flow of charging current from the battery charger to the battery and switchable between a first state, in which the switch isolates the battery from the charging circuit, and a second state, in which the switch allows the charging current to flow to the battery;

first means for automatically placing the switch in the first state during at least selected periods of interaction between the patient and the collecting means; and

second means for automatically placing the switch in the second state during at least selected periods characterized by an absence of interaction between the patient and the collecting means.

16. A personal health monitor comprising:

first means for automatically collecting a first set of data indicative of a first set of parameters indicative of the physical condition of a patient;

second means for automatically comparing the first set of data with a set of test criteria and for indicating when the first set of data fails to meet the test criteria;

third means for automatically collecting a second set of additional data from the patient only when the first set of data fails to meet the test criteria, said second set of additional data indicative of at least one additional parameter, not included in the first set of parameters, selected to provide additional diagnostic information useful in interpreting the first set of data; and

fourth means for automatically transmitting the first and second sets of data to a central location for analysis by trained medical personnel;

wherein the first set of data comprises information indicative of at least one physical measurement of a parameter included in the first set of parameters and indicative of the physical condition of the patient;

wherein the second set of data comprises information indicative of at least one physical measurement of said additional parameter.

20. A person health monitor comprising:

means for automatically monitoring a plurality of parameters indicative of the physical condition of a patient, said plurality of parameters including at least first and second parameters selected such that the correlation between the first and second parameters is diagnostically significant;

means for storing information indicative of a selected range of normal values of the first parameter, said selected range of normal values varying in accordance with the second parameter such that the selected range of normal values when the second parameter has a first value is different from the selected range of normal values when the second parameter has a second value;

means for alerting a central station only when the first parameter is outside the selected range of normal values.

4,803,626

UNIVERSAL CONTROLLER FOR MATERIAL DISTRIBUTION DEVICE

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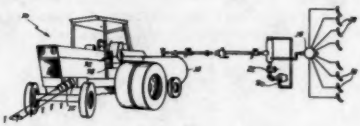
Filed Sep. 15, 1987, Ser. No. 97,451

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—424.07 **15 Claims**



1. A monitoring and control system for a mobile material distribution apparatus wherein the rate of material distribution per unit area varies as a predetermined function of the ground speed of the mobile apparatus and of the rate of operation of variable rate delivery means for delivering material at a controllable rate to material distribution means for distributing the material along the path of travel of the mobile apparatus; said system comprising: ground speed sensor means for developing a ground speed signal corresponding to the ground speed of the mobile apparatus and delivery rate sensor means for developing a delivery rate signal corresponding to a rate of delivery of material by said variable rate delivery means; monitoring and control circuit means responsive to said ground speed signal and to said delivery rate signal for developing a control signal for controlling the operation of said variable rate delivery means to achieve and maintain a desired rate of distribution of material along the path of travel of the mobile distribution apparatus, said monitoring and control circuit means further comprising processing means responsive to said ground speed and delivery rate signals for producing said control signals and for further producing display signals corresponding to associated functions and conditions of the mobile apparatus, and memory means for storing data and instructions for enabling said processing means to respond to delivery rate signals from each of a plurality of different types of delivery rate sensor means, means for identifying a particular type of delivery rate sensor means coupled with said control and monitoring circuit means; and said processing means being responsive to said sensor identifying means for selecting from said memory means data and instructions for enabling response to the delivery rate sensor means identified thereby.

4,803,627

SYSTEM FOR VEHICLE BODY ROLL CONTROL DETECTING AND COMPENSATING STEERING OPPOSITELY TO VEHICLE TURNING DIRECTION

Osamu Yasuike; Yasuji Arai; Hiroyuki Ikemoto; Nobutaka Owa, all of Toyota, and Shunichi Doi, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 24, 1987, Ser. No. 17,592

Claims priority, application Japan, Feb. 25, 1986, 61-039551

Int. Cl.[4] B60G *21/06*

U.S. Cl. 364—424.05 **9 Claims**

1. For a vehicle comprising a body and a plurality of wheels upon which said vehicle runs, a vehicle roll control system of vehicle height adjustment type, comprising:

a plurality of actuator assemblies, each corresponding to one of said vehicle wheels and resiliently suspending a corresponding said vehicle wheel from the vehicle body, each one of said actuator assemblies being adapted to increase or decrease vehicle height at a location corresponding to said corresponding vehicle wheel in accordance with signals supplied thereto;

a plurality of control means, each corresponding to one of

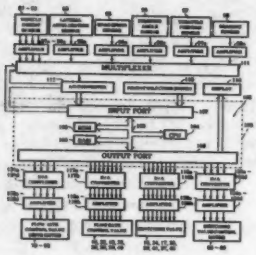
said actuator assemblies and serving to supply said control signals to said corresponding actuator assembly;

a vehicle speed detecting means for sensing a road speed of the vehicle;

a steering angle detecting means for sensing a steering angle of the vehicle;

a lateral acceleration detecting means for detecting a lateral acceleration of said vehicle body; and

a means for computing and control adapted to predictingly compute the roll angle of the vehicle body based upon the vehicle speed sensed by said vehicle speed detecting means and the steering angle sensed by said steering angle



detecting means and to control said plurality of actuator assemblies, via said plurality of control means, in accordance with said computed roll angle, so as to keep the rolling of said vehicle body within a determinate range; said computing and control means including means to compare a direction of the vehicle steering as detected by said steering angle detecting means with a direction of the lateral acceleration of said vehicle body as detected by said lateral acceleration detecting means, and not to effect said controlling of said plurality of actuator assemblies via said plurality of control means, when said direction of the vehicle steering is opposite to said direction of the lateral acceleration of said vehicle body.

4,803,628

METHOD AND APPARATUS FOR CONTROLLING ELECTRO-MAGNETIC PARTICLE CLUTCH

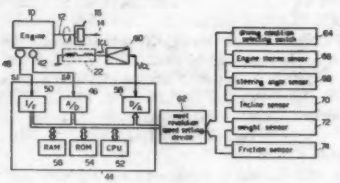
Takashi Hayashi; Setsuo Tokoro; Tomoyuki Watanabe, all of Susono, and Takashi Shigematsu, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 31, 1986, Ser. No. 891,317

Claims priority, application Japan, Aug. 2, 1985, 171665/85

Int. Cl.[4] F16H *5/66;* **B60K** *20/02*

U.S. Cl. 364—424.1 **53 Claims**



1. An apparatus for controlling an electromagnetic particle clutch in a vehicle comprising:

a first detecting means for detecting a throttle opening and for outputting a first detected signal;

a memory means for memorizing seven relationships;

a second detecting means for detecting an actual engine revolution speed and for outputting a second detected signal;

processor means comprising first, second, third and fourth calculating means, and first, second and third determining means;

said first calculating means for receiving the first and second detected signals and for calculating an engine torque utilizing a first of said seven relationships which uses the detected actual engine revolution speed and the detected throttle opening as parameters, the first calculating means outputting a first calculated signal;

said second calculating means for receiving the first detected signal and for calculating a tentative revolution speed utilizing a second of said seven relationships which uses the detected throttle opening as a parameter, the second calculating means outputting a second calculated signal;

a third detecting means comprising at least one detecting means for detecting at least one condition in which the vehicle begins moving and for outputting at least one of a plurality of third detected signals;

said first determining means for receiving at least said third detected signal and for determining a total compensation value utilizing a plurality of third of said seven relationships, said plurality of third relationships using at least said third detected signal as a parameter, the first determining means outputting a first determined signal;

said third calculating means for receiving said second calculated signal and said first determined signal and for calculating a desired revolution speed utilizing a fourth of said seven relationships, said fourth relationship using said calculated tentative revolution speed and said determined total compensation value as parameters, said third calculating means outputting a third calculated signal;

said fourth calculating means for receiving the first detected signal, and for calculating a feed back gain utilizing a fifth of said seven relationships which uses the detected throttle opening as a parameter, the fourth calculating means outputting a fourth calculated signal;

said second determining means for receiving the first, third and fourth calculated signals and the second detected signal, and for determining an optimum torque utilizing the sixth of said seven relationships which uses the calculated engine torque, the detected actual engine revolution speed, the calculated feed back gain and the calculated desired revolution speed as parameters, the second determining means outputting the second determined signal;

said third determining means for receiving the second determined signal and for determining a control voltage utilizing a seventh of said seven relationships which uses at least the determined optimum torque as a parameter, the third determining means outputting the third determined signal; and

a controlling means for receiving the third determined signal and for controlling electric current supplied to a magnetizing coil of the electro-magnetic particle clutch corresponding to the determined control voltage, whereby a torque transmitted from an engine to a transmission means by said electro-magnetic particle clutch is controlled utilizing at least one of the detected various conditions.

4,803,629

POWER STEERING APPARATUS AND CONTROL SYSTEM FOR POWER STEERING APPARATUS HAVING A STEERING WHEEL ANGLE DETECTION DEVICE

Yasuo Noto, Katsuta, and Noboru Sugiura, Mito, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 7, 1987, Ser. No. 1,325

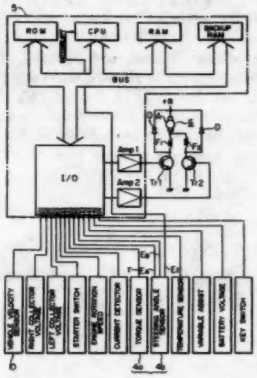
Claims priority, application Japan, Jan. 8, 1986, 61-644

Int. Cl.[4] B62D *50/06*

U.S. Cl. 364—424.05 **12 Claims**

1. A control system for a power steering apparatus including a steering angle sensor means for detecting each revolution of a steering wheel from a predetermined datum including at said datum and to produce an output signal indicative thereof, said steering angle sensor means also being for detecting discrete angular positions of said steering wheel during each revolution

thereof and to produce a signal indicative of each said angular position; a counter means for counting the signals indicative of each angular position; vehicle velocity determination means; resetting means for said counter means, whereby said resetting means reset the counter means when the vehicle velocity



determination means indicates a velocity above a predetermined value and said steering angle sensor produces an output signal indicative of said predetermined datum; and control means for effecting power steering control by utilising the count of said counter means as a parameter.

4,803,630

VEHICLE HEIGHT CONTROL SYSTEM

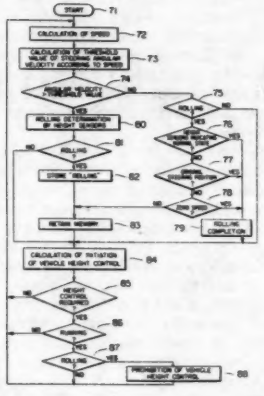
Shozo Takizawa; Mitsunori Maruyama; Minoru Tatemoto, all of Okazaki, and Shigeki Ohtagaki, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 766,955, Aug. 19, 1985, abandoned. This application May 3, 1988, Ser. No. 195,475

Claims priority, application Japan, Aug. 28, 1984, 59-178754

Int. Cl.[4] B60G *17/00*

U.S. Cl. 364—424.05 **7 Claims**



1. A vehicle height control system on a vehicle having a body supported on front and rear wheels by a suspension means, said control system including:

vehicle body height sensors associated with said front and rear wheels detecting and producing outputs representing height of the vehicle body on both sides of the vehicle with respect to the vehicle wheels,

a steering angle sensor detecting and producing an output representing steering angle of a steering wheel of the vehicle,

a vehicle speed sensor detecting and producing an output representing speed of the vehicle wheels, and

a control unit connected to operate said suspension means to adjust the height of said vehicle body to maintain a reference level based upon the outputs of said front and rear wheel body height sensors,

said control unit comprising first means for determining whether the vehicle is turning and in a rolling state,

said first means including means for determining vehicle speed based on the output of said vehicle speed sensor, for determining steering angular velocity based on the output of said steering angle sensor, and for detecting a rolling state of the vehicle based on:

(1) that the vehicle speed is not zero,

(2) a threshold value of steering angular velocity according to vehicle speed, and

(3) comparing the outputs of said vehicle body height sensors to determine, based on the pattern of their outputs, an amount of side-to-side inclination of the vehicle body indicating the rolling state, and

second means for inhibiting said control unit from operating said suspension means to adjust the height of the vehicle body when the vehicle is turning and in the rolling state as determined by said first means.

4,803,631

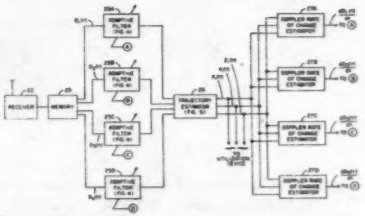
DOPPLER-ADAPTIVE FILTER FOR NON-ZERO MEAN DROPOUT NOISE

Anthony K. Newman, Woburn, Mass., assignor to Ratheon Company, Lexington, Mass.

Filed Sep. 25, 1987, Ser. No. 101,091

Int. Cl.[4] G06F *15/20*; G06G *7/78, 7/34*; G01S *13/08*

U.S. Cl. 364—462 **2 Claims**



1. A method for computing the trajectory of a first object moving relative to a second object, the first object carrying a transmitter and the second object carrying at least four receivers disposed to form a multi-static receiving system for signals from the transmitter, said method comprising steps, repeated until the difference between successively estimated trajectories is less than a predetermined difference, as follows:

(a) storing in a storage means representations of the signals received at each one of the at least four receivers;

(b) estimating the trajectory of the first object relative to the second object which could have produced the received signals;

(c) filtering the stored representations of the received signals using a filter adapted to pass signals such as would be received at each of the at least four receivers from an object carrying a transmitter and moving relative to the second object along the trajectory estimated in step (b);

(d) estimating the trajectory of the first object relative to the second object which could have produced the received signals as filtered in step (c), said estimation comprising the steps of:

(i) deriving, from the received signals in each one of the at least four receivers, corresponding signals indicative of the Doppler shift frequency of each one of the received signals;

(ii) integrating each one of the corresponding signals to produce position signals;

(iii) combining the position signals in pairs to form a first plurality of matrix equations;

(iv) independently processing each one of the matrix equations in the first plurality thereof to produce solutions for such equations;

(v) forming, from the solutions found in step (iv), a second matrix wherein the terms correspond to the coefficients of the Taylor series describing an estimate of the trajectory of the first body relative to the second body; and

(vi) solving the second matrix to derive the coefficients of the Taylor series describing the trajectory of the first body relative to the second body; and

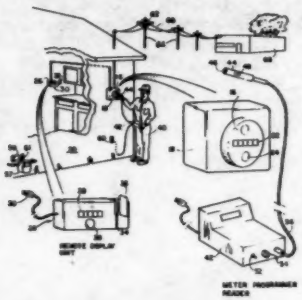
(e) repeating steps (c) and (d) until the difference between successively produced estimates of the trajectory of the first object relative to the second object is less than a predetermined value.

4,803,632

INTELLIGENT UTILITY METER SYSTEM

Larry H. Frew, Simi Valley, and Melvin L. Fuller, Ventura, both of Calif., assignors to Utility Systems Corporation, Tarzana, Calif.

Filed May 9, 1986, Ser. No. 861,560
Int. Cl.[4] G01R *21/133*; G06F *15/20*
U.S. Cl. 364—464.04 **12 Claims**



7. An intelligent utility meter system installation for measuring A.C. electric energy having repetitive A.C. cycles, comprising:

(1) an "outside" principal meter unit including:

(a) means for sampling current and voltage and for calculating power consumption at least 300 times per second; said sampling occurring asynchronously and not in any fixed timed relationship with respect to the A.C. electricity cycles;

(b) said outside unit further including means for determining the total kilowatt hours used, and the present billing status; and

(c) alphanumeric display means for displaying power being used, total kilowatt hours and present billing status;

(2) a remote "inside" unit including:

(a) alphanumeric means for displaying the information displayed by said "outside" unit;

(b) means for selectively retaining a desired continuously updated display; and

(c) means for reading a credit card and automatically changing the billing status information within the intelligent utility meter as credit card information is read; and

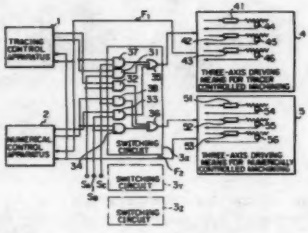
(3) said system including means for determining both the magnitude and direction of the electric power passing through said meter system.

4,803,633

MACHINE TOOL FOR TRACER CONTROLLED MACHINERY AND NUMERICAL CONTROLLED MACHINERY

Hajimu Kishi; Mitsuo Matsui, and Hitoshi Arumaki, all of Tokyo, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Continuation of Ser. No. 793,070, filed as PCT JP85/00073 on Feb. 20, 1985, published as WO85/03667 on Aug. 29, 1985, abandoned. This application Nov. 23, 1987, Ser. No. 129,374
Claims priority, application Japan, Feb. 20, 1984, 59-28803
Int. Cl.[4] B28Q *15/00, 35/12*
U.S. Cl. 364—474.03 **6 Claims**



1. A machine tool control system for tracer controlled machining and numerically controlled machining comprising:

a tracing control means for delivering a control instruction based on an externally generated input for tracer controlled machining;

a numerical control means for delivering a control instruction based on an externally generated input for numerically controlled machining;

three-axis driving means for tracer controlled machining for driving X, Y, and Z axis motions of tracer controlled operation and for detecting positions in X, Y, and Z axis directions;

three-axis driving means for numerically controlled machining for driving X, Y, and Z axis motions of numerically controlled operation and for detecting positions in X, Y, and Z axis directions, signals of the detection of positions in X, Y, and Z directions from said three-axis driving means for tracer controlled machining and said three-axis driving means for numerically controlled machining being fed back to said tracing control means and said numerical control means;

a plurality of switching circuits each of which has a logic gate circuit means for receiving instructions from said tracing control means and said numerical control means, and three kinds of operation selection signals through an array of input side gate circuits having groups of three logic gate circuits and delivering two kinds of output signals through an array of output side gate circuits to be supplied to said three-axis driving means for tracer controlled machining and said three-axis driving means for numerically controlled machining, wherein the outputs of said tracing control means and said numerical control means are connected to first input terminals of said array of input side gate circuits; and

operation selection inputting means having first, second, and third terminals receiving externally generated operation selection signals corresponding to a tracer controlled operation, a numerically controlled operation, and a tracer and numerically controlled operation, wherein said first, second and third terminals are connected to second input terminals of said array of input side gate circuits;

instructions from said tracing control means and said numerical control means being supplied to said first input terminals of said array of input side gate circuits in said switching circuits;

signals from said terminals of said operation selection inputting means being supplied to said second input terminals of said array of input side gate circuits in said switching circuits, such that

(a) when the first terminal in said operation selection inputting means is selected, both of said three-axis driving means for tracer controlled machining and for numerically controlled machining are controlled by the control instruction from said tracing control means,

(b) when the second terminal in said operation selection inputting means is selected, both of said three-axis driving means for tracer controlled machining and for numerically controlled machining are controlled by the control instruction from said numerical control means, and

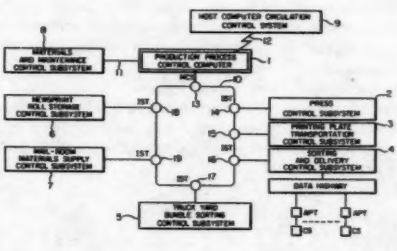
(c) when the third terminal in said operation selection inputting means is selected, the three-axis driving means for tracer controlled machining is controlled by the control instruction from said tracing control means and the three-axis driving means for numerically controlled machining is controlled by the control instruction from said numerical control means, concurrently, respectively and independently, said positions being continuously monitored even when switching between one of said first, second, and third terminals.

4,803,634

PRODUCTION PROCESS CONTROL SYSTEM IN NEWSPAPER PRINTING

Kinichiro Ohno, Tokyo, and Tomoshi Kawata, Yokohama, both of Japan, assignors to Tokyo Kikai Seisakuchi, Ltd., Japan

Filed Sep. 12, 1986, Ser. No. 907,305
Claims priority, application Japan, Sep. 12, 1985, 60-202383
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—478 **7 Claims**



1. A production process control system for a news printing system using rotary presses comprising:

(a) a press control subsystem means for controlling the presses;

(b) a subsystem means for controlling sorting and delivery;

(c) at least one of:

(i) a subsystem means for controlling printing plate transportation,

(ii) a subsystem means for controlling newsprint storage,

(iii) a subsystem means for controlling mailroom materials supply, and

(iv) a subsystem means for controlling truck yard bundle sorting,

(d) a production process control subsystem means for supervising and controlling each said subsystem means;

(e) each subsystem means comprising a station and each station comprising an intelligent input/output processor unit;

(f) a ring-like data highway means for connecting each station to the other stations;

(g) a circulation control subsystem means for controlling newspaper sales business processing; and

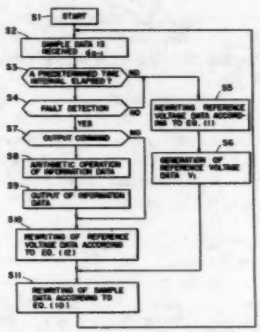
(h) connecting means for connecting the circulation process control subsystem means directly to the production process control subsystem means.

4,803,635

INFORMATION DATA OUTPUT DEVICE FOR ELECTRIC-POWER SYSTEMS

Fumio Andow, Hachioji, Japan, assignor to Kabushi Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 6, 1986, Ser. No. 927,382
Claims priority, application Japan, Nov. 7, 1985, 60-247959
Int. Cl.[4] G06F *15/56*; G01R *19/00*
U.S. Cl. 364—483 **12 Claims**


START
SAMPLE DATA IS RECEIVED
A PREDETERMINED TIME INTERVAL ELAPSED ?
FAULT DETECTION
OUTPUT COMMAND
ARITHMETIC OPERATION OF INFORMATION DATA
OUTPUT OF INFORMATION DATA
REWRITING OF REFERENCE VOLTAGE DATA ACCORDING TO EQ. (2)
REWRITING OF SAMPLE DATA ACCORDING TO EQ. (10)
REWRITING REFERENCE VOLTAGE DATA ACCORDING TO EQ. (1)
GENERATION OF REFERENCE VOLTAGE DATA V1
YES
NO

1. A method for obtaining information data in the form of a digital data obtained from an electric power system through detection of a fault in the system, comprising the steps of:

initiating an operation of fault detection;

judging whether or not a predetermined time has passed since initiating the operation of fault detection;

sampling data from said electric power system a predetermined number of times for each cycle of an electric quantity of said electric power system so as to produce sampled data successively;

rewriting a reference voltage data by another reference voltage data produced from the sampled data until said predetermined time has passed;

detecting a fault from the sampled data when said predetermined time has passed;

judging whether or not an output command exists when the fault is detected;

computing information data according to a predetermined formula when the output command exists,

outputting the result obtained by computation according to the output command;

rewriting the reference voltage data by another reference voltage data produced from the sampled data;

rewriting the sampled data by a new sampled value; and

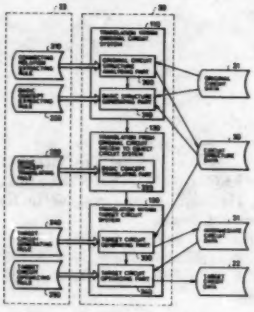
repeating the steps above-mentioned in sequence.

4,803,636

CIRCUIT TRANSLATOR

Tamotsu Nishiyama, Hirakata; Toshinori Watanabe, Segamihara; Noboru Horie, Takasaki; Makoto Furihata, Gunma; Yasuo Kominami, Takasaki, and Fumihiko Mori, Yokohama, all of Japan, assignors to Hitachi Ltd. and Hitachi Micro Computer Eng. Ltd., both of Tokyo, Japan

Filed Sep. 25, 1986, Ser. No. 911,324
Claims priority, application Japan, Sep. 27, 1985, 60-213964
Int. Cl.[4] G06F 7/00, 15/60
U.S. Cl. 364—491 11 Claims



1. A circuit translator for translating an original circuit constituted by a set of first elements into a logically equivalent target circuit constituted by a set of second elements, comprising:

a first memory section which stores translation rules for translating in the set of said first elements;

a second memory section which stores translation rules for translation in the set of said second elements;

a third memory section which stores translation rules for translation of the set of said first elements into the set of said second elements and

translation means which permits translation rules automatically selected from said first memory section to act upon original circuit data to translate the data into first intermediate data, which permits translation rules automatically selected from said third memory section to act upon said first intermediate data to translate the data into second intermediate data, and which permits translation rules automatically selected from said second memory section to act upon said second intermediate data to translate the data into target circuit data.

4,803,637

CRUISE CONTROL SYSTEM FOR A VEHICLE

Tetsuya Tada; Masumi Nagasaka; Hiroaki Tabuchi, all of Toyota, and Tatsuo Teratani, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 6, 1987, Ser. No. 70,188
Claims priority, application Japan, Jul. 17, 1986, 61-166803; Jan. 31, 1987, 62-19641
Int. Cl.[4] B60K 31/00
U.S. Cl. 364—426.04 6 Claims

1. A cruise control system for a vehicle having an internal combustion engine, an engine output control member, and an accelerator pedal connected to said engine output control member for operating said engine output control member in accordance with a requirement by an operator, said system comprising:

actuator means connected to said engine output control member for controlling engine output without operation of said accelerator pedal by an operator;

first detecting means for detecting an actual vehicle speed;

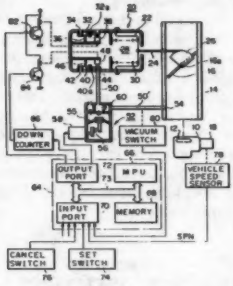
target value setting means for setting a target vehicle speed to be maintained by said cruise control system;

second detecting means for detecting commencement of a cruise control mode of operation;

electric signal forming means for forming electric signals for operating the actuator means and thereby controlling engine output and vehicle speed;

timer means for detecting first and second predetermined time lapses after detection of commencement of the cruise control mode of operation by said second detecting means;

first control means for controlling said electric signal forming means, prior to detection of said first predetermined time lapse by said timer means, so as to form a fixed level



electric signal for quickly moving the actuator means to prevent a temporary decrease of the vehicle speed;

second control means for calculating feedback factors based upon deviations between the actual vehicle speed detected by said first detecting means and the target vehicle speed set by said target value setting means, and for controlling said electric signal forming means, after detection of said first predetermined time lapse by said timer means, so as to form electric signals which are modified by said feedback factors; and

feedback gain control means for controlling gain of said feedback factors so that a value of said gain deceases after detection of said second predetermined time lapse by said timer means, whereby a quick and stable feedback control is realized.

4,803,638

ULTRASONIC SIGNAL PROCESSING SYSTEM INCLUDING A FLAW GATE

Lawrence D. Nottingham, Charlotte, N.C.; Thomas E. Michaels, and Jennifer E. Michaels, both of Freeville, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

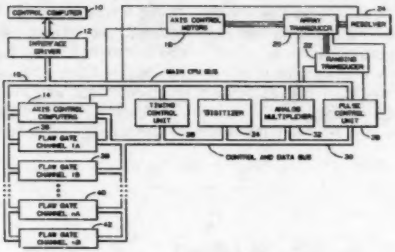
Filed Jun. 26, 1986, Ser. No. 878,817
Int. Cl.[4] G01N 29/04
U.S. Cl. 364—507 13 Claims

1. An ultrasonic signal processing system for an ultrasonic transducer, comprising:

transducer control and signal digitizing means for controlling transmit signal production, digitizing reflection signals and indicating transducer position; and

flaw indication processing means for storing the digitized reflection signals as a reflection waveform, comparing the reflection waveform to a threshold waveform, producing

and storing flaw indications when the reflection waveform exceeds the threshold waveform, and storing the transducer position in association with the flaw indications.



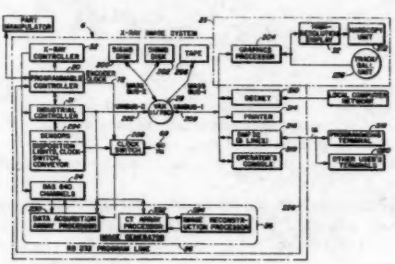
4,803,639

X-RAY INSPECTION SYSTEM

Douglas S. Steele; Larry C. Howington, both of West Chester; James W. Schuler, Oxford; Joseph J. Sostarich, Fairfield; Charles R. Wojciechowski, West Chester; Theodore W. Sippel, Cincinnati; Joseph M. Portaz, Hamilton; Ralph G. Isaacs, Cincinnati, all of Ohio; Henry J. Scudder, III, Medford; Thomas G. Kincaid, Lexington, both of Mass.; Kristina H. V. Hedengren, Schenectady, N.Y.; Rudolph A. A. Koegl, Niskayuna, N.Y.; John P. Keaveney, Schenectady, N.Y.; Joseph Czechowski, III, Clifton Park, N.Y.; John R. Brehm, Cincinnati, Ohio; James M. Brown, Jr., Albany, N.Y.; David W. Oliver, Schenectady, N.Y.; George E. Williams, Schenectady, N.Y., and Richard D. Miller, Schenectady, N.Y., assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 25, 1986, Ser. No. 832,511
Int. Cl.[4] G06F *15/20*; G01N *23/02*
U.S. Cl. 364—507 18 Claims

MICROFICHE APPENDIX INCLUDED
(81 Microfiche, 4703 Pages)



9. A computer based system for non-destructive measuring and testing of a manufactured part by X-ray analysis comprising:

a loading station for loading a part into a part holding mechanism, said mechanism being adapted to hold the part in a predetermined orientation;

conveyor means for transporting the part from the loading station to an inspection station;

an X-ray source for generating a high intensity X-ray radiation beam;

a linear array X-ray detector for converting received X-ray radiation into electrical signals representative thereof;

means in said inspection station for grasping said part holding mechanism and for positioning the part in an X-ray radiation path between the X-ray source and the X-ray detector;

means coupled to said grasping means for effecting relative motion between the part and said X-ray radiation beam; and

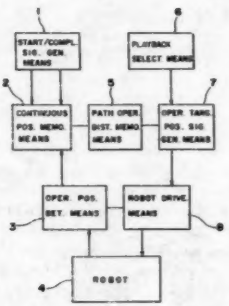
means for converting said electrical signals to data suitable for two dimensional representation such that the part can be measured and defects recognized from the representation.

4,803,640

CONTROL ARRANGEMENT FOR AN INDUSTRIAL ROBOT

Takashi Mitomi, Higashiosaka, and Hitoshi Kubota, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 11, 1987, Ser. No. 48,631
Claims priority, application Japan, May 12, 1986, 61-107902
Int. Cl.[4] G06F *15/46*; G05B *19/42*
U.S. Cl. 364—513 10 Claims



1. A control arrangement for an industrial robot, which comprises a continuous position memory means which detects and stores operating positions of the industrial robot moved per each predetermined period of time, after detecting and storing an operation starting position of the industrial robot, a start/completion signal generating means which generates an operation starting signal and an operation completion signal of said continuous position memory means based on instructions by an operator, a path operating distance memory means which obtains for storing, the operating distances of the industrial robot on the taught path from said operation starting position to the respective operating positions as stored in said continuous position memory means, an operation target position signal generating means which generates an operation target position signal through calculation of the operation target position of the industrial robot per each predetermined period of time, according to the operating speed as designated, by interpolating respective rotational and orthogonal components of the operating positions on the path memorized during the teaching by the operating distance from the starting position, and means for driving the industrial robot according to said operation target position signal thus generated.

4,803,641

BASIC EXPERT SYSTEM TOOL

Steven Hardy, Palo Alto, and Robert H. Joyce, San Jose, both of Calif., assignors to Tecknowledge, Inc., Palo Alto, Calif.

Continuation of Ser. No. 20,327, Feb. 19, 1987, abandoned, which is a continuation of Ser. No. 617,791, Jun. 6, 1984, Pat. No. 4,648,044. This application Nov. 25, 1987, Ser. No. 125,714
Int. Cl.[4] G06F *15/18*
U.S. Cl. 364—513 19 Claims

6. A knowledge system comprising a computer having a memory, said memory storing a knowledge base including

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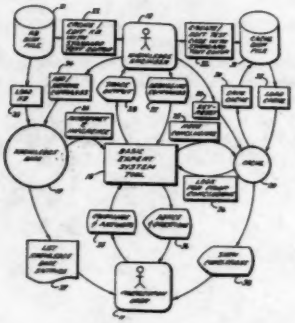
expressions and knowledge for determining values for said expressions, said memory including a cache porton for storing certain ones of said expressions and corresponding determined values for the stored expressions, said memory also storing a control procedure executable by said computer for interpreting the knowledge base to determine values for said expressions, said control procedure including

means for recognizing the occurrence of an expression in the knowledge base, means for searching the cache to determine whether the recognized expression is stored in the cache, means for obtaining from the cache the corresponding value of the recognized expression when the recognized expression is in the cache, and means for applying the knowledge in the knowledge base to determine a corresponding value for the recognized expression when the recognized expression is not in the cache and then storing the recognized expression and its corresponding value in the cache.



4,803,642

INFERENCE SYSTEM

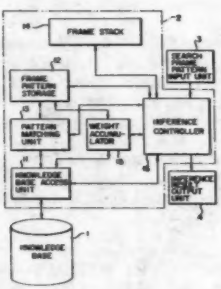
Tetsuro Muranaga, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 16, 1987, Ser. No. 74,029

Claims priority, application Japan, Jul. 21, 1986, 61-171081

Int. Cl.[4] G09B 7/12; G06F 12/00, 7/00

U.S. Cl. 364—513 **9 Claims**



1. An inference system comprising:

a knowledge base storing knowledge about objects, each of said objects being described by a frame comprising plural sets of slot-value pairs which represent an attribute of the respective object or a relation between the respective object and another object and to which a weight indicating the semantic strength of said attribute or said relation is assigned; and,

an inference processing unit for receiving a search frame pattern, said inference processing unit accessing said knowledge base on the basis of the search frame pattern, and executing an inference process in accordance with a specified frame specified by the search frame pattern or specified by a frame of a generic concept whose slot-value pairs are inherited by said specified frame, and also in accordance with a priority defined by said weight, thereby to obtain the results of said inference process.

4,803,643

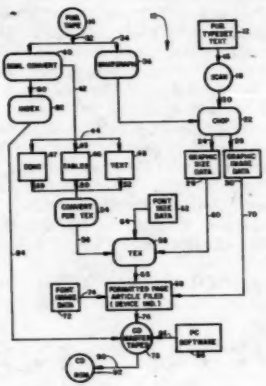
SYSTEM AND METHOD FOR CREATING MEMORY-RETAINED, FORMATTED PAGES OF TEXT, TABULATION, AND GRAPHIC DATA

Thomas B. Hickey, Columbus, Ohio, assignor to OCLC Online Computer Library Center Incorporated, Dublin, Ohio

Filed Aug. 10, 1987, Ser. No. 83,779

Int. Cl.[4] G06F 15/62

U.S. Cl. 364—523 **45 Claims**



1. A system for converting visual illustrations on paper and associated magnetic media retained text and tabulation typesetting data of a printed publication of articles, into universally outputable digital data form retained in master memory, comprising:

graphics locator means for determining the insertion locations referenced within said text and tabulations typesetting data representing the positioning of said visual illustrations;

scanning means for converting said visual illustrations to digital graphic data;

means for generating graphic property data representing the graphics size characteristics of said digital graphic data;

means for providing font size data for the text characters represented by said text typesetting data;

means for providing font image defining data;

formatting means responsive to said insertion location, said text typesetting data, said graphic property data and said font size data for generating device independent formatted page files; and

mastering means responsive to said digital graphic data, said device independent formatted page files, and said font image defining data for deriving said universally outputable digital data retained within said master memory.

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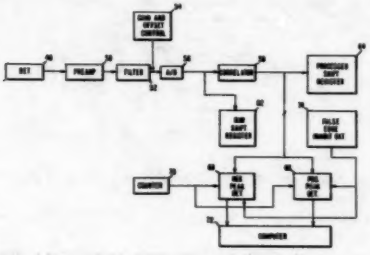
4,803,644

ALIGNMENT MARK DETECTOR FOR ELECTRON BEAM LITHOGRAPHY

James F. Frazier, Pacific Palisade; Oberdan W. Otto, Culver City, and John Pasiecznik, Jr., Malibu, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 20, 1985, Ser. No. 778,572
Int. Cl.[4] G01B 15/00; G01N 23/00
U.S. Cl. 364—559 15 Claims



15. In a system for detecting a single alignment mark which has a pair of opposed edges that are traversed by a scanning electron beam in at least one scan, in which the backscattered electrons from the mark are detected to provide an indication of the surface topology over which the beam is scanned, the improvement comprising:

circuit means responsive to the detected backscattered electron signal during each scan for generating a multi-bit scanning signal which corresponds to the backscattered electron signal resulting from that scan,

means for providing a predetermined multi-bit reference signal representive of an expected backscattered electron beam traversing an edge of the single alignment mark,

a plurality of correlator banks corresponding in number to the number of reference signal bits, each bank including a plurality of paired multi-cell scanning and reference signal shift registers corresponding in number to the number of bits in the scanning signal,

means for providing the bits of the multi-bit scanning signal to respective scanning shift registers within each correlator bank,

means for providing the individual bits of the reference signal to each reference signal shift register within respective correlator banks,

means for cross-multiplying the scanning signal held in each scanning shift register by the reference signal held in the corresponding reference shift register during each scan, accumulating and weighting the results in accordance with the significance of the scanning signal bit for each pair and the reference signal bit for each bank, to produce a weighted correlation output signal which is updated as scanning proceeds, and

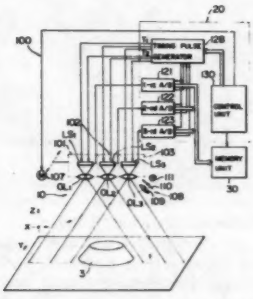
means for detecting the locations of the maximum and negative peak correlation values, said means for detecting comprising, for each peak, a scan location counter that locates the scanning signal with respect to the surface being scanned, a location storage means, means for applying a location signal from the scan location counter to the location storage means, a correlation storage means, means for applying a correlation signal from the comparing means to the correlation storage means, a comparator connected to compare the correlation signal with the signal sotred in the correlation storage means, the comparator connected to cause the location storage means and correlation storage means to load in their respective applied location and correlation signals when the correlation signal exceeds a level determined by the signal stored in the correlation storage means, and means for resetting the location storage means and correlation storage means for each successive scan, whereby after each scan the correlation storage means is storing the maximum signal correlation during the scan, and the location storage means is storing the location at which the maximum correlation occurred.

4,803,645

METHOD AND APPARATUS FOR MEASURING COORDINATES

Fumio Ohtomo, Asaka, and Hitoshi Otani, Tokyo, both of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1986, Ser. No. 909,254
Claims priority, application Japan, Sep. 19, 1985, 60-207676
Int. Cl.[4] G01B 11/14; G01C 11/12; G06F 15/20
U.S. Cl. 364—560 7 Claims



1. Apparatus for measuring the coordinates of a point on a three-dimensional object, said apparatus comprising:

detection means for viewing said object from at least three different directions and deriving three uniquely different kids of image information representative of a point on said object respectively designated first, second and third image information;

correlation means coupled to said detection means including means for setting said second image information as a measured reference point, means for deriving a correlation between said first image information and said second image information for producing information defining a first corresponding point correspondent to said measured reference point, and means for deriving a correlation between said second image information and said third image information for producing information defining a second correspondent point corresponding to said measured reference point;

computation means for computing a first signal representing first coordinates of said point from information defining said measured reference point and said first corresponding point, and for computing a second signal representing second coordinates of said point from information defining said measured reference point and said second corresponding point; and

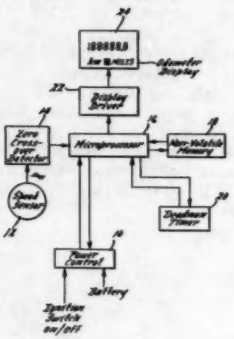
decision circuit means connected to receive said first and second signals respectively representing said first and second coordinates for determining whether or not said first and second coordinates are substantially in coincidence with each other and for indicating a mismatch when they are not substantially coincident.

4,803,646

ELECTRONIC ODOMETER

Michael J. Burke, Detroit; Richard A. Pidsosny, Canton, and Gerald J. Lehner, Westland, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 656,626, Oct. 1, 1984, Pat. No. 4,710,888.
This application Aug. 26, 1987, Ser. No. 89,466
Int. Cl.[4] G01C *22/00*
U.S. Cl. 364—561 6 Claims



1. An electronic odometer for an automotive vehicle comprising:

sensor means on said vehicle for detecting movement of said vehicle and providing an output signal indicative of predetermined portions of distance traveled;

computer means connected to said sensor means for accumulating said output signals from said sensor means into predetermined increments of distance and outputting an odometer data value as the summation of all increments of distance said vehicle has traveled;

memory means, connected to said computer means, having a plurality of non-volatile and individually addressable locations each one having the capacity for storing an odometer data value corresponding to a summation of all predetermined increments of distance traveled by said vehicle along with predetermined parity codes; and

means connected to said computer means for displaying the odometer data value for visual observation within said vehicle,

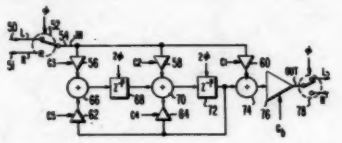
said computer means programmed to read the most recently written parity correct odometer data value stored in one of the separately addressable locations of said non-volatile memory means as a base value, to accumulate data values from said sensor means output signal until each time an accumulated data value equals a predetermined increment of distance value to accumulate the occurrences of said accumulated data values equaling said predetermined increment of distance value, to sum the value of said accumulated increment occurrences and the base value read from said non-volatile memory means as the newest odometer data value, to write said newest odometer data value and a predetermined parity code to one of the individually addressable locations of said non-volatile memory means having an address that is different from that of the location containing the most recently stored odometer data value, whenever said newest odometer data value exceeds said base value by a predetermined amount that is greater than said predetermined increment, and whenever said newest odometer data value exceeds the most recently written odometer data value by said predetermined amount.

4,803,647

SAMPLED DATA AUDIO TONE CONTROL APPARATUS

Charles B. Dieterich, Kingston, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed May 30, 1986, Ser. No. 868,669
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.17 3 Claims



1. Tone control apparatus for processing sampled data audio signals, comprising:

a signal input terminal for applying said sampled data audio signals;

a cascade connection of alternating combining means and delay elements wherein each delay element is coupled between two combining means, each of said combining means having at least two input terminals and an output terminal, each of said delay elements having an input terminal coupled to the output terminal of the immediately preceding combining means and an output terminal coupled to an input terminal of the immediately succeeding combining means of said cascade connection;

a first plurality of weighting circuits for weighting samples applied thereto by respective coefficient values, each of said weighting circuits having an input terminal coupled to said signal input terminal, having respective coefficient input terminals and having respective output terminals coupled to input terminals of respective combining means;

a second plurality of weighting circuits for weighting samples applied thereto by respective coefficient values, each of said weighting circuits of said second plurality having an input terminal connected at the output terminal of the lastmost delay element of said cascade connection, having respective coefficient input terminals, and having respective output terminals coupled to input terminals of the firstmost and respective intermediate ones of said combining means of said cascade connection;

a further weighting means having an input terminal coupled to the output terminal of the lastmost combining means of said cascade connection, having a coefficient input terminal and having an output terminal at which tone controlled audio signals is available;

coefficient providing means having user input controls, and programmed to provide predetermined sets of coefficient values responsive to user input stimuli; and

means for coupling said predetermined sets of coefficient values to the coefficient input terminals of said first and second pluralities and further weighting means.

4,803,648

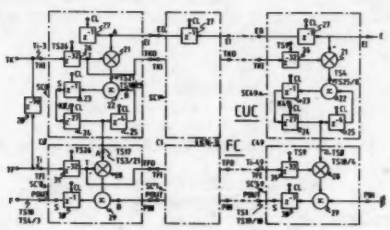
ECHO CANCELLER USING AN ADAPTIVE FINITE IMPULSE RESPONSE FILTER

Rudolf F. I. Dierckx, Wilrijk; Daniel Sallaerts, Aarschot, and Pierre-Paul F. Guebels, Edegem, all of Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Jun. 27, 1985, Ser. No. 749,354
Claims priority, application European Pat. Off., Jul. 12, 1984, 84201049.8
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.19 14 Claims

1. Signal processing arrangement including at least one processing device with a series of interconnected processing cells (SC0/49, SC0/49) which are each to calculate a same

function of the type p+mn of three periodic variables m, n and p which are applied to first (TFI, TKI), second (A) and third (B) inputs of said cells which further have a first output (TFO, TKO) connected to the firs tinput of a following cell considered in the direction from a first cell to a last cell and a second output (S) on which appears the result of a cell calculation, said variables m and n being input variable sand said variable p being the result of the calculation of said function p+mn in a previous cell, and corresponding variables m, n and p applied to said cells and provided by said cells being successively time shifted with respect to one another, characterized in that each of said cells (SC0/49, SC0/49) includes calculation means (37, 36) which calculates said function in a bit serial way and provides an output bit in every time slot, with said variable m



(T_{i-k}) having a duration of q (32) time slots and said variable n ($K_{k,k}$, D^i) comprising a number of at most q bits each having a duration of one time slot, and that in each cell said first input (TFI, TKI) is connected to said first output (TFO, TKO) via a sample and hold circuit (310, 311; 260, 261) whose output is connected to an input (T0, T1) of said calculation means to supply said variable m thereat, the sample and hold circuits of said successive cells being controlled by respective ones of time shifted control signals (UPD0/49) which are successively delayed with respect to one another by one time slot when considered in a direction opposite to said first mentioned one, in such a way that the variables m supplied to said successive cells are mutually delayed by q−1 time slots when considered in said first mentioned direction.

4,803,649

MODULO-2-ADDER FOR THE LOGIC-LINKING OF THREE INPUT SIGNALS

Heinz-Peter Holzapfel, Munich, and Karlheinrich Horninger, Eglharting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 17, 1987, Ser. No. 26,736

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1986, 3610058

Int. Cl.⁴ G06F 7/50

U.S. Cl. 364—784 **16 Claims**

1. A modulo-2-adder for the logic linking of three input signals (A,B,C), comprising, in combination:

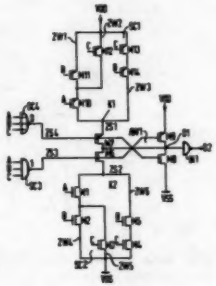
a first circuit component (SC1) having three circuit arms (ZW1, ZW2, ZW3) connected to receive said three input signals, each arm comprising two switching elements (M10, M11; M10, M12; M13, M14) which are arranged between a first fixed potential (VDD) and a first node (K1) and which apply an intermediate signal (ZS1), corresponding to the first binary value ("1"), to the first node when two input signals each assume the other binary value ("0");

first connecting means for connecting said input signals (A,B,C) individually to the switching elements of said first circuit component (SC1);

a second circuit component (SC2) have three circuit arms (ZW4, ZW5, ZW6) connected to receive said three input signals, each arm comprising two series-connected switching elements (M1, M2; M1, M3; M4, M5) which are arranged between a second fixed potential (VSS) and a second node (K2) and which apply an intermediate signal (ZS2), corresponding to the other binary value, to the second node when two input signals each assume the first binary value;

second connecting means for connecting said input signals (A,B,C) individually to the switching elements of said second circuit component (SC2);

a third circuit component (SC3) having three inputs for said three input signals for emitting a third intermediate signal (ZS3), corresponding to the other binary value, when all said input signals (A,B,C) assume the first binary value;



a fcurth circuit component (SC4) having three inputs for said three input signals and which generates a fourth intermediate signal (ZS4), corresponding to the first binary value, when all said input signals assume the second binary value; and

an analysis circuit (AW) connected to said first, second, third and fourth circuit components, operative to switch through the first or second intermediate signals (ZS1, ZS2) to the output when the third intermediate signal (ZS3) assumes the first binary value and the fourth intermediate signal (ZS4) assumes the other binary value, but which otherwise switches through the third or fourth intermediate signal in inverted form to the output.

4,803,650

METHOD OF CONFIGURING AN N- TH DEGREE SWITCHED CAPACITOR FILTER

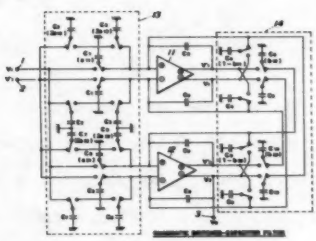
Toshimichi Nishimura, and Atsushi Kikuchi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,192

Claims priority, application Japan, Apr. 8, 1985, 60-73892

Int. Cl.⁴ G06G 7/02

U.S. Cl. 364—825 **4 Claims**



1. A method of configuring an n-th degree switched capacitor filter circuit having transfer characteristics expressed by

$$H(z) = \frac{a_n z^{-n} + a_{n-1} z^{-n+1} + \ldots + a_1 z^{-1} + a_0}{B_n z^{-n} + B_{n-1} z^{-n+1} + \ldots + B_1 z^{-1} + B_0} \quad (1)$$

where n is greater than 1, z is a variable, and a and B are coefficients, as any given n-th degree transfer function H(z), characterized in a step of expanding the above n-th degree transfer function H(z) in the form of an n-element linear simultaneous state equation of n state voltages V_1 to V_n inclusive of a last-stage output voltage as

$$\begin{bmatrix} V_1 \\ \cdot \\ \cdot \\ \cdot \\ V_n \end{bmatrix} = \quad (2)$$

$$\begin{bmatrix} a_{11} a_{12} z^{-1} \\ \cdot \\ \cdot \\ \cdot \\ a_{n2} a_{n2} z^{-1} \end{bmatrix} \begin{bmatrix} V_I \\ \\ V_I \end{bmatrix} + \begin{bmatrix} b_{11} z^{-1} \ldots b_{1n} z^{-1} \\ \cdot \\ \cdot \\ \cdot \\ b_{n1} z^{-1} \ldots b_{nn} z^{-1} \end{bmatrix} \begin{bmatrix} V_1 \\ \cdot \\ \cdot \\ \cdot \\ V_n \end{bmatrix}$$

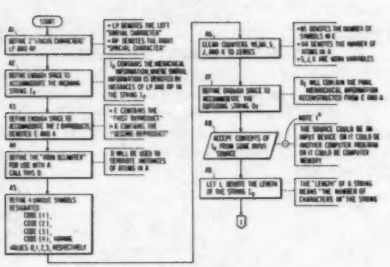
where V_I denotes an input voltage, z is the variable, and a and b are coefficients calculated from the transformation of equation (1) to the linear simultaneous state equation (2) with respect to inner state voltages V_1 to V_n of the filter circuit; and a step of configuring selected circuit components of a filter circuit to correspond practically to each of the coefficients a_{11} to b_{nn} determined in a solution to the n-element linear simultaneous state equation (2) above.

4,803,651

METHOD FOR ENCODING AND DECODING ACYCLIC, LINKED-LIST DATA STRUCTURES FOR EFFICIENT STORAGE, RETRIEVAL AND SEARCHING

Jan T. Galkowski, Endicott, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Feb. 10, 1986, Ser. No. 827,690
Int. Cl.[4] G06F *9/40, 15/40, 12/08*
U.S. Cl. 364—900 **14 Claims**



11. A method of incorporating spatial information into machine readable hierarchical information to enable said hierarchical information to be efficiently machine searched against target hierarchical information with respect to string equality, spatial equality or overall equality, said method comprising the steps of:

(a) storing said machine readable hierarchical information in a form which includes information identifying a distance between an initial character on the line and an reference line,

(b) scanning said stored hierarchical information to add a pair of spatial characters thereto, one or more of a first spatial character inserted prior to an initial character on a line and one or more of a second spatial character inserted after a line ending, said spatial characters explicitly representing spatial information,

(c) scanning the result of step (b) to produce a pair of byproduct strings, a first byproduct string comprising four distinct symbols, each instance of a first symbol representing a different instance of said first spatial character, each instance of a second symbol representing a different instance of said second spatial character, each instance of a third symbol representing a different instance of a contiguous string in said hierarchical information and each instance of a fourth symbol representing each different string of blanks in said hierarchical information, and a second byproduct string comprising a sequence of the non-blank strings in said hierarchical information, and

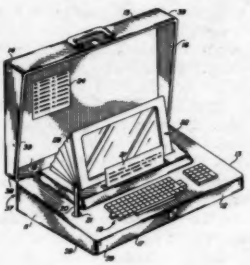
(d) storing said first and second strings.

4,803,652

PORTABLE TRANSCEIVER

William C. Maeser, 4425 N. 78th St., B-233, Scottsdale, Ariz. 85251, and Ward W. Maeser, 2093 E. 10th St., Tempe, Ariz. 85281

Filed Sep. 30, 1986, Ser. No. 913,743
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—708 **2 Claims**



1. A portable terminal device adapted to be carried to a site and to perform transaction operations by transmitting and receiving data to and from a central unit through communication means, said portable terminal device comprising:

(a) means for inputting transaction defining data;

(b) memory means for storing transaction defining data entered by said input means;

(c) control means coupled to said memory means for determining

(i) when sufficient transaction defining data is stored in said memory means for a transaction and said terminal device is in a transaction ready state, and

(ii) when insufficient transaction defining data is stored in said memory means for a transaction and said terminal device is in a transaction inhibit state;

(d) transmission means coupled to said memory means for transmitting selected transaction defining data stored in said memory means through said communication means to said central unit when said control means determines said terminal device is in said transaction ready state;

(e) a housing for said input, memory, transmission and control means, said housing including at least one wall having

(i) an intermediate layer of plastic material,

(ii) an outer and inner layer of corrugated cardboard material, and

(iii) an outer layer of tensioned resilient material adjacent and covering said outer layer of corrugated cardboard,

said plastic material

being resilient when a force is applied against a selected

area of said plastic material and said plastic material can flex to resist said force generally without permanent deformation of said plastic material, and

being readily compressed and permanently deformed when a force is applied to said plastic material and said material cannot flex to resist said force,

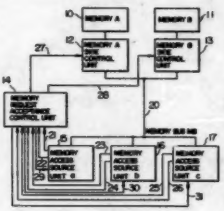
said outer and inner layers of cardboard being biased with respect to one another.

4,803,653

MEMORY CONTROL SYSTEM

Kenji Suzuki; Toshiyuki Takagi, and Tomoya Nishi, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,817
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—900 **10 Claims**



1. A memory control system comprising:

a plurality of individually operable memory units;

a plurality of memory access source units for generating an access request and applying the generated access request to one of the plurality of memory units;

a signal memory bus in data communication between the plurality of memory units and the plurality of memory access source units, for selectively transmitting address information and data during one of a plurality of time slots;

means for receiving a present access request from the memory access source units;

first means for detecting a memory conflict between the present access requested and a previous access request received prior to the present access request;

means for predicting which future time slots are to be used for transmitting data and address information, the prediction being based on the type of access request generated, the relationship between the type of access request and the future time slots of the bus being predefined;

second means for detecting a bus conflict between one of the predicted time slots and a previously predicted time slot for the previous access request; and

means for rejecting the present access request when a conflict on the bus or in the requested memory unit is detected by the detection means.

4,803,654

CIRCULAR FIRST-IN, FIRST OUT BUFFER SYSTEM FOR GENERATING INPUT AND OUTPUT ADDRESSES FOR READ/WRITE MEMORY INDEPENDENTLY

Joseph D. Rasberry, Bethel, and Karl D. Nitschke, Brookfield, both of Conn., assignors to General Datacomm Industries, Inc., Middlebury, Conn.

Filed Jun. 20, 1985, Ser. No. 747,095
Int. Cl.[4] G06F 12/02
U.S. Cl. 364—900 **12 Claims**

1. A first in, first our buffer system comprising:

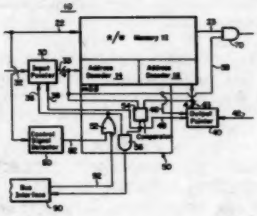
an addressable read/write memory means comprising a data input and a data output, means for storing data applied to said data input at a first address specified by a first address input and means for providing to said data output data stored at a second address specified by a second address input,

an input address decoder for selecting a specific address in said read/write memory means at which data is to be stored in response to the first address input,

an output address decoder for selecting a specific address in said read/write memory means from which stored data is to be provided to said data output in response to the second address input,

an input counter for generating said first address which is applied to said input address decoder,

an output counter for generating said second address which is applied to said output address decoder,



means for resetting said input and output counters,

means for enabling the input counter so that it can be incremented in response to a signal applied to an input of said counter,

means for enabling the output counter so that it can be incremented in response to a signal applied to an input of said counter, and

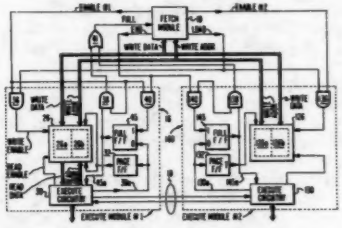
means for comparing the output of said input counter and the output of said output counter and for activating said resetting means when the outputs of said counters are the same.

4,803,655

DATA PROCESSING SYSTEM EMPLOYING A PLURALITY OF RAPIDLY SWITCHABLE PAGES FOR PROVIDING DATA TRANSFER BETWEEN MODULES

Laurence P. Flora, Covina, Calif., assignor to Unisys Corp., Detroit, Mich.

Continuation of Ser. No. 327,626, Dec. 4, 1981, abandoned. This application Dec. 28, 1987, Ser. No. 139,074
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—900 **8 Claims**



1. In a data processing system, the combination comprising:

a memory containing instructions;

a fetch module for retrieving instructions from said memory and for preparing instruction data required for execution; and

an execute module for performing data processing operations in response to instruction data applied thereto from said fetch module;

said execution module including a randomly addressable read/write scratch pad memory having a plurality of logically switchable pages operable to permit said execute module to randomly read instruction data from one of said pages for the performance of a data processing operation while concurrently permitting said fetch module to randomly write instruction data required for use in a subsequent data processing operation into a different one of said pages;

said execute means being operable to provide for logical page switching without any transfer of data therebetween in a manner such that, after said execute module has completed data processing with respect to instruction data read from one page, the pages are logically switched so that another page can be randomly read by said execute module while said one page becomes available to have new instruction data randomly written therein by said fetch module;

said execute module being operable following said switching to signal said fetch module that a page is available in said scratch pad memory for receiving new instruction data.

4,803,656

SEMICONDUCTOR MEMORY DEVICE HAVING REDUNDANCY CIRCUIT PORTION

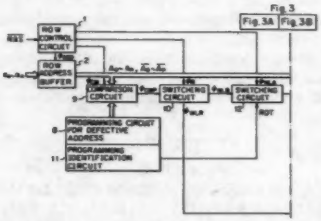
Yoshihiro Takemae, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 20, 1987, Ser. No. 28,463

Claims priority, application Japan, Mar. 20, 1986, 61-060929

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—200 **2 Claims**



1. A semiconductor memory device comprising:

a regular memory cell array in which a plurality of word lines and bit lines are provided, and a plurality of memory cells are arranged at each intersection of said word lines and bit lines;

a redundancy memory cell array in which one or more word lines and bit lines are provided,. and a plurality of memory cells are arranged at each intersection of said word lines and bit lines in said redundancy memory cell;

control means for generating a first control signal;

means for programming defective address bits corresponding to a defective memory cell existing in said regular memory cell array;

means for comparing each logic state of input address bits with each of said defective address bits;

a first switching means for generating a second control signal when at least one logic state of said input address bits does not coincide with a corresponding one of said defective address bits and for supplying a third control signal to a predetermined word line or bit line belonging to said redundancy memory cell array without generating said second control signal when each logic state said input address bits coincides with each of said defective address bits;.

means for identifying whether or not said defective address bits are programmed in said programming means; and

a second switching means for supplying said second control signal input from said first switching means to a selected word line or bit line belonging to said regular memory cell array when said identifying means indicates that said defective address bits are programmed in said programming means and for supplying said first control signal input from said control means to said selected word line or bit line when said identifying means indicates that said defective address bits are not programmed in said programming means.

4,803,657

SERIAL FIRST-IN-FIRST-OUT (FIFO) MEMORY AND METHOD FOR CLOCKING THE SAME

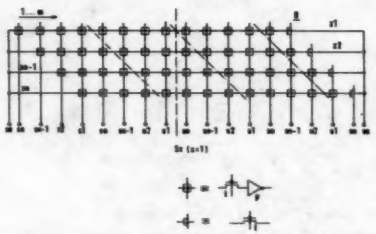
Burkhard Giebel, Denzlingen, and Ulrich Theus, Gundelfingen, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Apr. 28, 1987, Ser. No. 43,384

Claims priority, application European Pat. Off., May 2, 1986, 86106049.9

Int. Cl.[4] G11C *19/28*

U.S. Cl. 365—221 **5 Claims**



1. An improvement in a serial FIFO memory comprising a plurality of insulated-gate field-effect transistors of the same conductivity and control type, each having an input and output, said plurality of transistors being arranged and configured into n signal branches ($z_1 \ldots z_n$), each with m cells, which comprise parallel signal paths, the inputs thereof being coupled to a signal input (s_e) of said memory and the outputs thereof being coupled to a signal output (s_a) of said memory, each signal branch comprising m transfer transistors, each having a source-drain section arranged in a series signal path for transmitting therethrough input signals having a predetermined data rate, a gate of each of the transfer transistors in each signal branch being supplied with clock signals whose effective pulses, in direction from the m-th to the first transfer transistor in each branch, are in such a timely succession that the transistors are rendered conductive one at a time in turn, said improvement comprising:

wherein said memory exclusively serves as a memory for digital signals;

wherein the number of clock signals equals n, and their repetition rate equals one n-th of said data rate of said input signals;

wherein of said m transfer transistors in each signal branch:

in the first signal branch (z_1),

the first, the (n+1)th, the (2n+1)th, . . . , and the (qn+1)th transfer transistors are clocked by the n-th clock signal (s_n), the second, the (n+2)th, the (2n+2)th, . . . , and the (qn+2)th transfer transistors are clocked by the (n−1)th clock signal (s_{n-1}), and so forth in an identical pattern for each remaining transfer transistor and clock signal until the n-th, the 2n-th, the 3n-th, . . . , and the qn-th transfer transistors are clocked by the first clock signal (s_1),

in the second signal branch (z_2)

the first, the (n+1)th, the (2n+1)th, . . . , and the (qn+1)th transfer transistors are clocked by the (n−1)th clock signal (s_{n-1}), the second, the (n+2)th, the (2n+2)th, . . . , and the (qn+2)th transfer transistors

are clocked by the (n=2)th clock signal and so forth in an identical pattern for each remaining transfer transistor and clock signal until the n-th, the 2n-th, the 3n-th, . . . , and the qn-th transfer transistors are clocked by the n-th clock signal, and

continuing in an identical pattern for each remaining signal branch until in the last signal branch (z_n)

the first, the (n+1)th, the (2n+1)th, . . . , and the (qn+1)th transfer transistors are clocked by the first clock signal (s_1), the second, the (n+2)th, the (2n+2)th, . . . , and the (qn+2)th transfer transistors are clocked by the n-th clock signal (s_n), and so forth in an identical pattern for each remaining transfer transistor and clock signal until the n-th, the 2n-th, the 3n-th, . . . , and the qn-th transfer transistors are clocked by the second clock signal, with q indicating the number of complete blocks consisting of n times n transfer transistors as counted from the signal input, and

where in each signal branch, a level generator (p) is connected to the output of the source-drain section of each transfer transistor except the m-th one; and

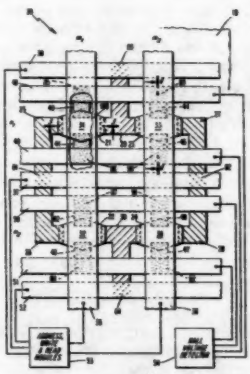
wherein said inputs of said signal branches are directly applied to said signal input (s_e) and said outputs thereof are directly applied to said signal output (s_a).

4,803,658

CROSS TIE RANDOM ACCESS MEMORY

Elizabeth H. Grimes, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1987, Ser. No. 3,536
Int. Cl.[4] G11C *11/14*
U.S. Cl. 365—87 **8 Claims**



1. A cross tie random access memory comprising: spaced binary memory elements of thin film magneto-resistive material;

a source, drain, and channel under each memory element forming a transistor with the memory element acting as the gate of the transistor;

means for addressing selected ones of the memory elements;

means for applying a WRITE voltage across the source and the drain under an addressed one of the elements to create a write current of magnitude and direction in the channel under the addressed memory element sufficient to change the binary memory state of the addressed memory element;

means for applying a READ voltage across the source and the drain under the addressed memory element to create a read current in the channel under the addressed memory element insufficient to change the memory state of the addressed memory element and sufficient to generate a Hall voltage in the channel under the addressed memory element at times when that element is in one of its binary memory states; and

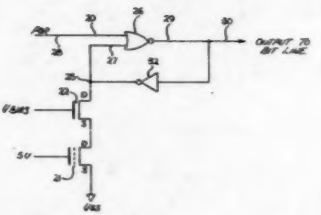
means for sensing the presence and absence of a generated Hall voltage in the channel under the addressed memory element to determine the binary memory state of that element.

4,803,659

EPROM LATCH CIRCUIT

Kirby S. Hallenbeck, Shingle Springs, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 22, 1987, Ser. No. 5,925
Int. Cl.[4] G11C *7/00, 17/00, 11/34, 11/40*
U.S. Cl. 365—94 **10 Claims**



1. A circuit for latching a state of a memory, comprising:

a first gating means coupled to said memory for reading said state of said memory;

said first gating means also coupled to receive an enabling signal which activates said reading of said memory;

said first gating means further coupled to the output of a feedback means and to the input of a second gating means;

said second gating means having a first input, said first input being coupled to said first gating means for receiving said state of said memory when said first gating means is activated;

said second gating means having a second input, said second input coupled to a reset signal;

said second gating means having an output, said output being determined by said state of said memory once said reset signal is deactivated;

said feedback means coupled to said output and said first input of said second gating means to latch said first input to said memory state, such that when said first gating means is deactivated, said input is latched to coincide with said memory state.

4,803,660

OPTICAL RECORDING MEDIUM

Tadashi Kobayashi, Chiba; Katsumi Suzuki, Tokyo, and Naomasa Nakamura, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

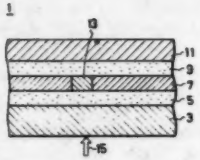
Filed Feb. 24, 1987, Ser. No. 18,282
Claims priority, application Japan, Feb. 28, 1986, 61-41681; Mar. 24, 1986, 61-63936; Mar. 24, 1986, 61-63937
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—113 **5 Claims**

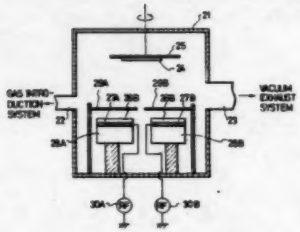
1. An optical recording medium of phase transition type comprising:

(a) a substrate; and

(b) a recording layer supported on said substrate, said recording layer comprising more than 80% by volume of an intermetallic compound having one kind of crystalline structure in an intermediate solid phase with a melting point between 300° to 800° C. capable of undergoing phase-changing from an equilibrium phase to a non-

equilibrium phase when said recording layer is heated by a laser beam and then quenched, and from a non-equilibrium phase to an equilibrium phase when said recording layer is heated by a laser beam and then cooled gradually.



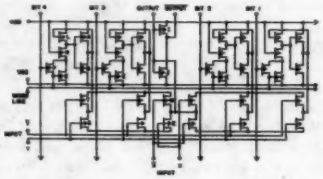


4,803,661

LOW POWER EPROM LOGIC CELL AND LOGIC ARRAYS THEREOF

William J. Mandl, Canoga Park, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.

Filed Aug. 6, 1987, Ser. No. 82,167
Int. Cl.[4] G11C *11/34, 7/00*
U.S. Cl. 365—184 **10 Claims**



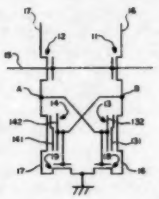
1. A programmable logic cell comprising:
a plurality of circuit sections each having a threshold alterable transistor;
a plurality of bit lines, at least one such bit line respectively connected to each said circuit section for altering the programming threshold of said transistor;
a plurality of input lines connected to said cell for receiving input logic signals;
at least one output line connected to said cell for transferring an output logic signal from said cell; and
a plurality of driver transistors including at least one driver transistor associated with each threshold alterable transistor, each such driver transistor providing the output signals to said output line and being connected for buffering said threshold alterable transistor thereby reducing the current handling requirement of said threshold alterable transistor;
the respective programming thresholds of said alterable transistors determining the Boolean logic function of said logic cell, the logic state of said output logic signal being dependent on said cell Boolean logic function and the logic states of said input logic signals, the logic cell having all possible Boolean logic functions for the number of said input signals.

4,803,662

EEPROM CELL

Kenichi Tanaka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 15, 1986, Ser. No. 896,719
Claims priority, application Japan, Oct. 21, 1985, 60-235946
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 **9 Claims**



1. An EEPROM cell for a memory device comprising
a pair of floating-gate transistors consisting of a first memory transistor and a second memory transistor, and
a pair of bit lines consisting of a first bit line corresponding to said first memory transistor and a second bit line corresponding to said second memory transistor,
each of said floating-gate transistors having a floating gate and a control gate, the floating gate of said first floating-gate transistor being coupled to said first bit line, the floating gate of said second floating-gate transistor being coupled to said second bit line, the control gate of said first floating-gate transistor being connected to said second bit line and the control gate of said second floating-gate transistor being connected to said first bit line,
wherein information stored in said cell is determined by detecting which of said memory transistors has a floating-gate in charged condition and which in uncharged condition, and application of a higher voltage on one of said bit lines and a lower voltage to the other of said bit lines causes one of said memory transistors to be in charged condition and the other of said memory transistors to be in uncharged condition.

4,803,563

SEMICONDUCTOR MEMORY HAVING DIVIDED BIT LINES AND INDIVIDUAL SENSE AMPLIFIERS

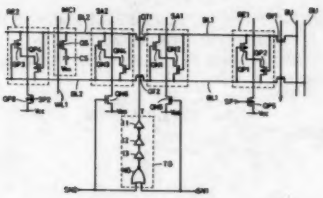
Hiroshi Miyamoto, and Michihiro Yamada, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1987, Ser. No. 27,536
Claims priority, application Japan, Mar. 18, 1986, 61-62052
Int. Cl.[4] G11C *7/00, 11/40*; H03K *5/24*
U.S. Cl. 365—189 **10 Claims**

1. A semiconductor memory comprising:
a plurality of word lines for selecting a memory cell,
a plurality of pairs of folded bit lines, each of said pairs of folded bit lines comprising a plurality of pairs of divided bit lines (BL1, BL1, BL2, BL2),
a plurality of memory cells connected between a divided bit line of each of said pairs of divided bit lines and each of said word lines,
first switching means (QT1, QT2) provided for each of said pairs of divided bit lines for connecting and disconnecting adjacent divided bit lines to each other,
sense amplifiers (SA1, SA2) provided for each of said pairs of divided bit lines, respectively, each restore circuit com-

prising a transistor of a first conductivity type for detecting and amplifying the potentials on the divided bit lines, restore circuits (RE1, RE2) provided for each of said pairs of divided bit lines, respectively, and comprising a transistor of a second conductivity type for pulling up the potential on the bit line at a high potential,

delay means responsive to an activating signal of said sense amplifiers for establishing a predetermined delay time, and control means (TG) coupled to first switching means and to



said delay means and responsive to an activating signal of said sense amplifier provided for the pair of divided bit lines connected to the selected memory cell when information stored in the memory cell selected from said memory cells is read out, for controlling by turning said first switching means on after the predetermined delay time since the sense amplifier was operated, so that said pair of divided bit lines connected to the selected memory cell and a pair of divided bit lines adjacent thereto may be connected to each other.

4,803,664

DYNAMIC RANDOM ACCESS MEMORY HAVING A GAIN FUNCTION

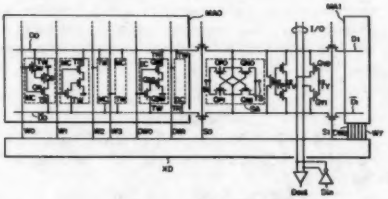
Kiyoo Itoh, Higashikurume, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 27, 1987, Ser. No. 31,002

Claims priority, application Japan, Mar. 28, 1986, 61-68326; Jun. 20, 1986, 61-143001

Int. Cl.[4] G11C *7/02*

U.S. Cl. 365—210 **42 Claims**



1. A dynamic random access memory including a plurality of pairs of data lines, a plurality of word lines intersecting the data lines, a plurality of memory cells each one having a read terminal, a write terminal and a gain function, and a common data line connected to the data lines, wherein:

said plurality of memory cells are connected to said plurality of pairs of data lines each respective pair of data lines being associated with a plurality of memory cells arranged in such a manner that the electrical characteristics of each pair of data lines are substantially balanced; and

each pair of data lines receive differential signals.

4,803,665

SIGNAL TRANSITION DETECTION CIRCUIT

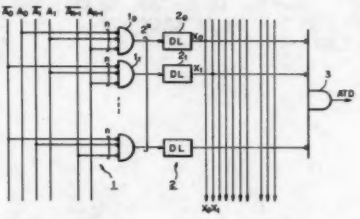
Yasushi Kasa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 7, 1987, Ser. No. 82,547

Claims priority, application Japan, Aug. 7, 1986, 61-184264

Int. Cl.[4] G11C *7/00, 8/00*; H03K *19/094, 19/20*

U.S. Cl. 365—230 **4 Claims**



1. A signal transition detection circuit comprising:

decoder means for decoding a plurality of signals to generate decoding signals;

delay means, connected to said decoder circuit and having plural outputs, for delaying the decoding signals, said delay means having a rise delay time period and a fall delay time period which are different from each other;

and wherein each or said delay means comprise a plurality of delay circuits, each including:

a first capacitor connected to said decoder means;

two serially-connected inverters connected to said first capacitor and having an output, each of said serially-connected inverters having a rise time period and a fall time period which are different from each other; and

a second capacitor connected to the output of said serially connected inverters; logic means, connected to said delay means, for performing a logic operation upon the outputs of said delay means to generate a pulse signal indicating a transition of said plurality of signals.

4,803,666

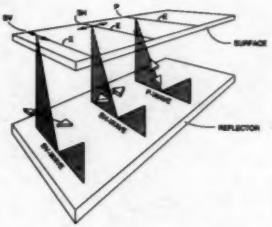
MULTISOURCE MULTIRECEIVER METHOD AND SYSTEM FOR GEOPHYSICAL EXPLORATION

Richard M. Alford, Broken Arrow, Okla., assignor to Standard Oil Company (Indiana), now Amoco Corp., Chicago, Ill.

Filed Jul. 20, 1984, Ser. No. 633,160

Int. Cl.[4] G01V *1/30*

U.S. Cl. 367—36 **68 Claims**



1. A method for geophysical exploration of the earth's subterranean formations comprising the steps of:

imparting seismic wave energy into the earth's subterranean formations with a seismic source having at least two linearly independent lines of action; and

detecting at least two linearly independent components of the seismic wave energy imparted by the seismic source

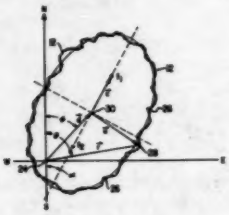
along each individual line of action after the seismic wave energy has interacted with the earth's subterranean formations.

4,803,667

TELEVIEWER PROCESSING SYSTEM

Robert W. Siegfried, II, Frisco, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 13, 1986, Ser. No. 930,169
Int. Cl.[4] G01V *1/28*
U.S. Cl. 367—69 **8 Claims**



1. A method of displaying the detailed contour of a borehole comprising the steps of:

(a) measuring, for a plurality of angles in a horizontal plane with respect to a horizontal reference point, the relative travel time of a signal transmitted from a sonde in said borehole, reflected by an area in the wall of said borehole and received by said sonde;

(b) calculating a best fit ellipse from said relative travel times;

(c) correlating said relative travel times with said best fit ellipse to provide corrected travel times; and

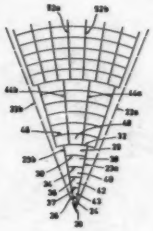
(d) displaying said corrected travel times so as to indicate said detailed contour of said borehole.

4,803,668

METHOD OF 3-D SEISMIC IMAGING FOR STRUCTURES WITH APPROXIMATE CIRCULAR SYMMETRY

John R. Berryhill, and John C. Wride, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed May 27, 1988, Ser. No. 199,942
Int. Cl.[4] G01V *1/36, 1/38*
U.S. Cl. 367—72 **9 Claims**



1. Method of acquiring seismic imaging reflection data for input to a 3-D migration process, comprising

locating a central position that is universally central to the dominant dip directions from a peaked stratigraphic subsurface,

orienting radial survey lines for the taking of common mid-point reflection data with polar symmetry with respect to said central position, and

establishing annular sector binning units for the acquired and sorted survey data within a ratio of substantially 2-to-1 for the largest bin to the smallest bin by increasing the number of bins within a revolution as the radial distance from the center is increased,

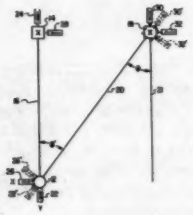
wherein said largest bin size provides data density for valid migration processing.

4,803,669

THREE-COMPONENT THREE-DIMENSIONAL SEISMIC DATA ACQUISITION

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 19, 1986, Ser. No. 944,401
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—72 **2 Claims**



1. A method for producing three-component three-dimensional seismic data for use in analyzing subsurface structures in which at least one receiver used to produce such acquisition does not lie on a seismic line of the seismic source comprising the steps of:

(a) establishing a connect line joining said off-line receiver and said seismic source at a location where said seismic source injects a seismic signal into the subsurface having shear wave components, and determining the angle between said connect line and the source shot line and the angle between said connect line and the receiver shot line; and

(b) normalizing the signals received by two shear wave detectors of said receiver by performing a mathematical rotation transformation on said receiver and a mathematical rotation transformation on said source to produce a signal equivalent to what would have been detected by said two shear wave detectors if said receiver and said seismic source had been physically oriented along a seismic line extending between said acoustic source and said receiver.

4,803,670

ULTRASONIC RANGING DEVICE

Ming-Hui Chen, Taipei, Taiwan, assignor to Li-Ling Lin, Taipei, Taiwan

Filed Jul. 7, 1987, Ser. No. 70,564
Int. Cl.[4] G01S *15/93;* G08G *1/16*
U.S. Cl. 367—99 **1 Claim**

1. In an improved ultrasonic ranging device having an ultrasonic sensor unit with a protective cover fixedly provided therein for detecting the distance between a ground object and the rear end of a vehicle during reverse movement, a control circuit electrically connected to the ultrasonic sensor unit for effecting electrical control operations, and a motor mechanism connected to the control circuit for providing forward and reverse rotations, the improvement which comprises:

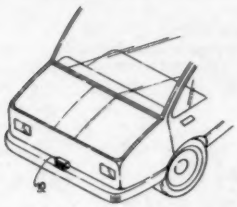
a body structure composed of a front casing and a rear casing with a round opening formed in each end thereof and an auxiliary illuminating light provided on one side of

the front casing and electrically connected to the control circuit for illuminating the rear path and providing a warning signal when the reverse gear of a vehicle is set to make a backward movement;

a plurality of switches respectively coupled with the ultrasonic sensor unit and the control circuit for being automatically operated to effect distance detecting and rotation control operations; and

transmission means furnished at each end of said body structure and rotatably coupled with the motor mechanism as well as movably kept in contact with said switches for being driven to open and close said body structure as well as to turn on and off said switches in performing detecting operations; whereby, distance detecting operations can be effectively started and stopped along with the backward and forward movements of the vehicle;

said transmission means comprising a triangular shaped cover having a pair of annular side lugs integrally formed



at each end for being movably connected to said body structure at each end thereof through said round openings; a pair of wheels each having a gear disk provided in a center area thereof and separately fixed within each end of said triangular shaped cover through an axle with one gear disk of said gear disks at one side being rotatably engaged with a reduction gear of the motor mechanisms, and another gear disk at another side being provided with a sector rail on a top surface for being rotated to make contact with respective switches in connection with a positive rotation and a reverse rotation of the motor mechanism; so that when the reverse gear is set to move the vehicle backward, said transmission means will drive said triangular shaped cover to raise up from said body structure for range detection operation, while, as the gear is shifted to move the vehicle forward, said transmission means will drive said triangular shaped cover to lower down from said body structure for protecting the ultrasonic sensor unit from water, dust and mud.

4,803,671

SENSOR FOR ACOUSTIC SHOCKWAVE PULSES

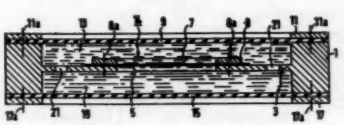
Hans Rochling, Bamberg, and Karl H. Schlee, Neunkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 29, 1987, Ser. No. 79,177

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625820

Int. Cl.[4] H01L *41/04*

U.S. Cl. 367—166 **12 Claims**



1. A sensor for acoustic shockwave pulses, comprising:

a pair of spaced coupling membranes defining an intervening space;

a piezo-electric measuring membrane arranged between said pair of coupling membranes;

a coupling medium filling said intervening space for transmitting acoustic shockwave pulses;

a housing ring having end faces and a partition with a central opening;

retaining rings being having faces generally the same shape as said end faces of

said housing ring and clamping said coupling membranes to said end faces of said housing ring; and

said measuring membrane being mounted covering said central opening in said partition.

4,803,672

ELECTRIC TIMEPIECE

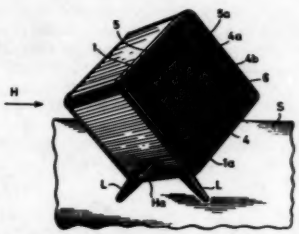
Klaus D. Zang, Homburg, Fed. Rep. of Germany, assignor to Walter GmbH, Mettlach, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 82,787

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1986, 8621553

Int. Cl.[4] G04C *17/00*

U.S. Cl. 368—241 **14 Claims**



1. An electrically operated timepiece comprising a housing; a dial provided on said housing and having at most seventeen radiation sources to indicate hours and minutes, said sources including twelve first radiation sources forming a substantially annular first symmetrical array, and a second symmetrical array of four second radiation sources within the confines of said first array, said radiation sources being arranged to emit radiation in response to connection with a source of electrical energy, said dial having a substantially square or rectangular outline and including four corner portions and said housing having means for maintaining said dial in such orientation that one of said corner portions is located at a level below all other corner portions when the maintaining means is placed onto a substantially horizontal surface; and means for selectively connecting said radiation source to an energy source.

4,803,673

STRIKING MECHANISM CLOCK WITH SWITCHABLE LIFTING STUD CYLINDER

Rolf Hepfer, Bad Durrheim, and Jürgen Rüuzler, Spaichingen, both of Fed. Rep. of Germany, assignors to Joseph Kieninger Uhrenfabrik GmbH, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 213,785

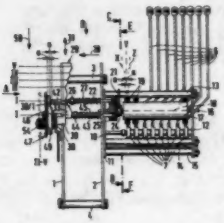
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3809902

Int. Cl.[4] G04B *21/00*

U.S. Cl. 368—269 **10 Claims**

1. A striking mechanism clock, comprising a clock movement and a mechanical striking mechanism including a plurality of striking hammers having contact levers, the hammers being disposed on one common turning arbor of a hammer shaft, a lifting stud cylinder with a mantle surface having a plurality of groups of lifting studs disposed staggered axially

with respect to each other, each group of which effecting a different striking sequence of the striking hammers, and each group adapted to being brought into a working position by an axial displacement of the lifting stud cylinder in relation to contact levers of the striking hammers; a manually adjustable correcting element which has several correcting steps disposed crosswise to the axis of the lifting stud cylinder and shiftable on a work bedplate, said correcting element being connected to the lifting stud cylinder by a contact slider, said contact slider



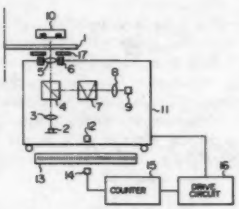
being spring biased toward the correcting steps running parallel to the axis of the lifting stud cylinder, the lifting stud cylinder being set in response to said clock movement into one of a plurality of working positions; means for manually adjusting the working position of the lifting stud cylinder including the corresponding element; and means for automatically adjusting the position of the lifting stud cylinder including a cam disk with an annular step cam adapted to be brought into operative connection with the contact slider of the lifting stud cylinder alternatively instead of the manual control element.

4,803,674

MAGNETO-OPTICAL RECORDER WITH SMALL-SIZED, LOW-POWERED ELECTROMAGNETIC COIL

Takeshi Nakao, Sagamihara, and Yutaka Akiba, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1986, Ser. No. 932,578
Claims priority, application Japan, Nov. 20, 1985, 60-258535
Int. Cl.[4] G11B *11/14, 13/04*
U.S. Cl. 369—13 **22 Claims**



1. A magneto-optical recorder for use with a recording medium having a magnetic recording film, comprising:

an optical head for irradiating said recording medium with a light beam, and including a focusing lens for focusing said light beam on said recording medium; and

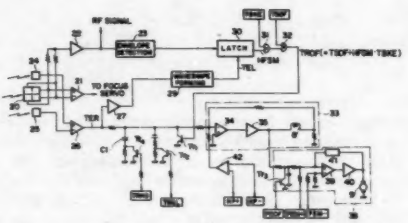
magnetic field generating means disposed in a facing relation with said focusing lens through said recording medium, for generating a magnetic field, said magnetic field generating means including an electromagnetic coil, said electromagnetic coil including a magnetic core having a magnetic main pole and a magnetic sub-pole and a coil winding, said coil winding being wound on said magnetic main pole and at least a part of said magnetic sub-pole contacting at least a part of a periphery of said coil winding wherein said magnetic sub-pole of said magnetic core has a length in a direction transverse to the recording and reproducing direction on said recording medium which is smaller than the length of said magnetic main pole of said magnetic core.

4,803,675

HIGH SPEED, LOW POWER CONSUMPTION PICKUP HEAD POSITION CONTROL DEVICE IN AN OPTICAL TYPE DISC REPRODUCING DEVICE

Hirotake Komatsu, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan and Hirotake Komatsu

Filed May 29, 1985, Ser. No. 738,826
Claims priority, application Japan, Jun. 1, 1984, 59-113680
Int. Cl.[4] G11B *17/22, 7/00*
U.S. Cl. 369—32 **5 Claims**



1. A pickup head position control device in an optical type disc reproducing device comprising:

an optical head having an optical system projecting a laser beam from a laser source on a disc and receiving reflected or transmitted laser beam from the disc thereby to read information recorded on the disc, and a tracking actuator for changing an optical path of said optical system for performing a tracking control;

optical head feed means having a feed motor for moving the optical head, means for generating an optical head feeding drive signal and means for servo-controlling the feed operation;

tracking control means having tracking error detection means, means for generating a tracking actuator drive signal in response to a tracking error signal and means for servo-controlling the tracking control;

tracking servo switching means for periodically switching on and off the tracking servo-control operation, wherein said tracking servo switching means includes means for detecting when the tracking error has a value which will result in braking of the optical head and means for causing the tracking servo-control operation to be switched on in a period of time during which the tracking error will result in braking;

kick pulse drive means for generating a kick pulse for jumping over tracks and driving said tracking actuator when the tracking servo-control operation is in an off state; and

position information detection means for detecting position of the disc which the optical head is presently accessing by reading position information recorded on the disc, said detection being performed when the tracking servo-control operation is in an on state.

4,803,676

CIRCUITRY FOR AN AUDIO OR VIDEO DISK PLAYER

Dieter Baus, Kehl, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

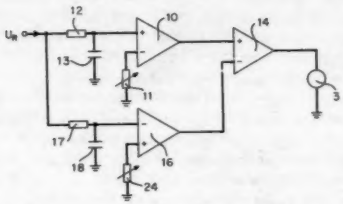
PCT No. PCT/EP86/00126, § 371 Date Dec. 22, 1986, § 102(e) Date Dec. 22, 1986, PCT Pub. No. WO86/05308, PCT Pub. Date Sep. 12, 1986

PCT Filed Mar. 8, 1986, Ser. No. 945,575

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1985, 3508422

Int. Cl.[4] G11B *19/20, 21/10*

U.S. Cl. 369—143 11 Claims



1. An arrangement for an audio or video disk player with remote scanning by a scanning component for carrying out servo track readjustment in a track guidance system, comprising:

a combination of coarse-drive means and fine precision-drive means for radial servo readjustment of said scanning component;

having a control parameter providing a radial-error signal for operating said coarse-drive means;

means for applying pulses dependent on said radial-error signal to said coarse-drive means for starting up said coarse-drive means;

said precision-drive means comprising a fine tracking actuator and said coarse-drive means comprising a coarse positioning actuator;

a processing circuit for receiving said radial-error signal, said processing circuit having a comparator with a variable threshold for detecting the direction in which said coarse-drive means is to be driven.

4,803,677

ROTARY RECORDING MEDIUM HAVING A GUIDE TRACK AND RECORDING AND REPRODUCING APPARATUS THEREFOR

Hirohisa Yamaguchi; Horoshi Usami, both of Tokyo; Tadao Nagai, Sagamiko, and Akira Mashimo, Tokorozawa, all of Japan, assignors to TEAC Corporation, Tokyo, Japan

Filed Jun. 12, 1986, Ser. No. 873,407

Claims priority, application Japan, Jun. 28, 1985, 60-141695; Jun. 28, 1985, 60-141696

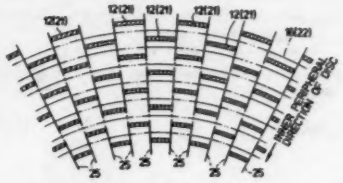
Int. Cl.[4] G11B *7/007, 7/095*

U.S. Cl. 369—44 8 Claims

1. A rotary recording medium comprising:

a recording surface which is divided into a plurality of imaginary equiangular sectoral regions each of which is defined by two of a plurality of imaginary radial lines; and

a guide track formed on said recording surface, said guide track comprising a spiral track or concentric tracks, each track turn of said guide track being constituted by a row of pits formed in every other of said equiangular sectoral regions, said pit being only formed in one of two mutually adjacent track turns of the guide track in each of said equiangular sectoral regions so that the pits are formed in every other track turns of the guide track in a radial direction of the rotary recording medium in each of said equiangular sectoral regions, each pit having two ends which respectively lie on two imaginary radial lines defining said each pit,



an intermediate part between center lines of said two mutually adjacent track turns of the guide track being used for forming a recording track for an information signal at a time of a recording.

4,803,678

DISC CARTRIDGE

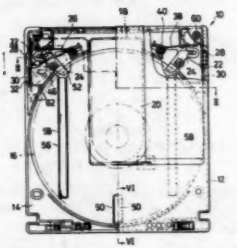
Kimio Tanaka, and Haruo Shiba, both of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Dec. 16, 1986, Ser. No. 942,495

Claims priority, application Japan, Dec. 18, 1985, 60-194560

Int. Cl.[4] G11B *23/03*

U.S. Cl. 369—291 13 Claims



1. A disc cartridge, comprising:

a casing comprising an upper cover plate and a lower cover plate joined together to define a space therein;

a disc rotatably housed in said space of said casing;

a shutter for operating at least one window provided in said casing to allow insertion of a disc driving mechanism therethrough into said disc cartridge;

actuator means arranged in said casing and engaged with said shutter to releasably lock said shutter; and

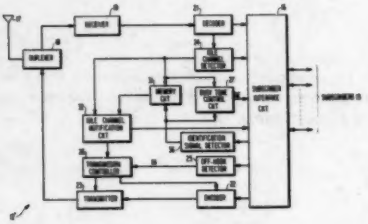
a disc receiver arranged in said casing and operatively connected to said actuator means to selectively receive therein a part of a peripheral portion of said disc;

said disc receiver being formed at a portion thereof approachable to said disc into a sideways U-shape so as to define therein a recess which selectively receives a part of said peripheral portion of said disc therein due to movement of said actuator means.

4,803,679
COMMUNICATION NETWORK CAPABLE OF AUTOMATICALLY INFORMING A SUBSCRIBER OF OCCURRENCE OF AN IDLE CHANNEL

Toshimitsu Shimizu, c/o NEC Corporation, 33-1, Shiba 5-chome, Minato-ku, Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,520
Claims priority, application Japan, Apr. 9, 1986, 61-81894; May 9, 1986, 61-104970
Int. Cl.[4] H04J 3/16
U.S. Cl. 370—95 6 Claims



1. In a communication network comprising a station which accommodates a plurality of subscribers and to which a plurality of output channels are assigned, said subscribers carrying out communication through said station and said output channels, said station comprising first detecting means for detecting whether or not an idle one of said output channels is present, second detecting means for detecting off-hook states of said subscribers, and tone supplying means coupled to said first and said second detecting means for supplying a specific tone to an off-hook one of said subscribers that is in the off-hook state when no idle channel is detected by said first detecting means, the improvement wherein said station comprises:

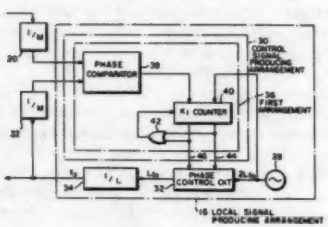
storage means coupled to the respective subscribers and to said first detecting means for storing an identification signal indicative of said off-hook subscriber when no idle channel is detected by said first detecting means; and

informing means, coupled to said storage means and said first detecting means, for informing said off-hook subscriber of presence of an idle channel when said idle channel is detected by said first detecting means.

4,803,680
DESTUFFING CIRCUIT WITH A DIGITAL PHASE-LOCKED LOOP

Yoshinori Rokugo, and Botaro Hirosaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,240
Claims priority, application Japan, Dec. 27, 1985, 60-293247; May 15, 1986, 61-109572
Int. Cl.[4] H04J 3/07
U.S. Cl. 370—102 6 Claims



1. In a destuffing circuit responsive to an input pulse sequence comprising data pulses, stuffing pulses, and control pulses, and to a data pulse timing signal, for producing an output pulse sequence in which said stuffing and said control pulses are removed, said destuffing circuit comprising local signal producing means responsive to said data pulse timing signal for producing a local signal and destuffing means responsive to said input pulse sequence for producing said output pulse sequence by using first through M-th timing sequences derived from said data pulse timing signal and first through M-th local sequences derived from said local signal where M represents a predetermined number, said local signal producing means comprising:

main local clock generating means for generating a main local clock sequence having a controllable phase;

control signal producing means responsive to a predetermined one of said first through the M-th timing sequences and a preselected one of said first through the M-th local sequences for producing a control signal;

phase controlling means responsive to said control signal for controlling said controllable phase of the main local clock sequence to produce a controlled clock sequence; and

divider means for frequency dividing said controlled clock sequence to produce said local signal;

said control signal producing means comprising:

first means for digital processing said predetermined one of the first through the M-th timing sequences and said preselected one of the first through the M-th local sequences to produce one of a first addition instruction pulse and a first subtraction instruction pulse at a time; and

intermediate means coupled to said first means for producing each of said first addition instruction pulse and said first subtraction instruction pulse as said control signal;

said first means comprising:

additional local clock generating means for generating an additional local clock sequence which has a frequency not higher than that of said main local clock sequence;

multiple state quantization phase comparator means responsive to a predetermined phase difference and said additional local clock sequence for detecting a detected phase difference by subtracting a phase of said preselected one of the first through the M-th local sequences from a phase of said predetermined one of the first through the M-th timing sequences, said multiple state quantization phase comparator means producing a lag indicating pulse when said detected phase difference is larger than said predetermined phase difference, said multiple state quantization phase comparator means producing a lead indicating pulse when said detected phase difference is smaller than said predetermined phase difference;

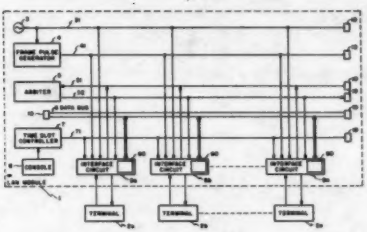
first up/down counter means coupled to said multiple state quantization phase comparator and having a first initial value, a first upper threshold value, and a first lower threshold value, said first upper threshold value being higher than said first initial value, said first lower threshold value being lower than the first initial value, said first up/down counter means being responsive to said lag indicating pulse and said lead indicating pulse for counting up and down a first count in synchronism with said lag indicating pulse and said lead indicating pulse, respectively, said first up/down counter means producing said first addition instruction pulse whenever said first count increases up to said first upper threshold value, said first up/down counter means producing said first subtraction instruction pulse whenever said first count decreases down to said first lower threshold value; and

first initializing means for initializing the first count in said first up/down counter means to said first initial value whenever said first up/down counter means produces one of said first addition instruction pulse and said first subtraction instruction pulse.

4,803,681
DATA TRANSMISSION CONTROL SYSTEM

Kiyoh Takahashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 6, 1987, Ser. No. 70,036
Claims priority, application Japan, Jul. 8, 1986, 61-161120
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—85 7 Claims



1. A data transmission control system comprising:

a plurality of terminal means, each of said terminal means having a data transmit path connected to a data bus, said terminal means transmitting transmit data to said data transmit path after confirming that transmit data is absent on said data bus, and said terminal means retransmitting said transmit data after again confirming that transmit data is absent on the data bus in response to said terminal means failing to receive from an addressee an acknowledge information which is indicative of a receipt of the transmit data within a predetermined period of time;

a plurality of data transmission control means, each of said data transmission control means being disposed between a respective one of the data transmit paths of the terminal means and the data bus connected thereto, upon receipt of the transmit data from said terminal means said data transmission control means temporarily storing said transmit data and making a request for a data transmission right to the data bus, and transmitting the transmit data from the terminal to the data bus only when said transmission control means has gained said data transmission right;

an arbiter means responsive to a receipt of the requests for a data transmission right from the data transmission control means for granting the data transmission right to the data bus to the data transmission control means according to a predetermined priority order;

means in any of the data transmission control means which has requested the data transmission right but failed to gain the data transmission right for erasing the temporarily stored transmit data.

4,803,682
RESETTING SYSTEM

Seiji Hara, and Satoshi Kobayashi, both of Saitama, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 4, 1985, Ser. No. 707,609
Int. Cl.[4] G06F 11/00
U.S. Cl. 371—12 8 Claims

1. A resetting system in an apparatus provided with a main CPU for controlling the whole apparatus and a plurality of slave CPUs each controlling a respective terminal portion of the apparatus to be controlled, the main CPU and said slave CPUs being connected through a common transmission line through which response data is sent from a particular slave CPU to the main CPU as a result of the main CPU sending a command including an address code to address said particular slave CPU, the system comprising:

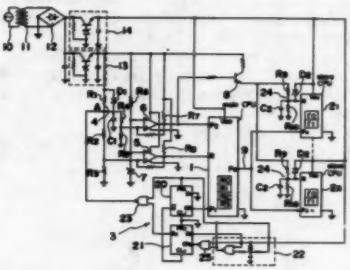
a programming unit provided in the main CPU, including means for

outputting strobe signals at a given period of time,

determining the existence of communication errors when the response data is not sent in accordance with a predetermined format, and

outputting a first reset signal when a predetermined number of communication errors are generated in succession;

a watch-dog timer for receiving the strobe signals and outputting a second reset signal upon the absence of said strobe signals;



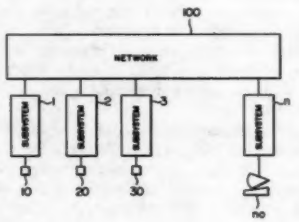
main CPU reset means for resetting the main CPU in response to the outputting of the second reset signal; and

slave CPU reset means for resetting said plurality of slave CPUs in response to the outputting of either the first reset signal or the second reset signal.

4,803,683
METHOD AND APPARATUS FOR TESTING A DISTRIBUTED COMPUTER SYSTEM

Kinji Mori, Yokohama; Yasuo Suzuki, Ebina; Katsumi Kawano, Fuchu; Masayuki Orimo, Machida; Minoru Koizumi, Yokohama; Hirokazu Kasajima, Hitachi, and Konan Nakai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1986, Ser. No. 895,375
Claims priority, application Japan, Aug. 30, 1985, 60-191782; Dec. 11, 1985, 60-281418
Int. Cl.[4] G06F 11/00
U.S. Cl. 371—19 17 Claims



1. A method for testing a program in a distributed processing system including a plurality of processors connected through a network, each of said processors operating independently form each other, said method comprising the steps of:

determining whether or not said program in said distributed processing system is to be test-run by a particular one of said plurality of processors;

acquiring test information corresponding to said program when said program is determined to be test-run by said particular one of said plurality of processors; and

executing said test-run of said program on the basis of said test information;

wherein said determining, acquiring and executing steps are

performed during on-line operation of said distributed processing system.

4,803,684

APPARATUS FOR DATA ERROR CORRECTION USING ROUNDING TECHNIQUE

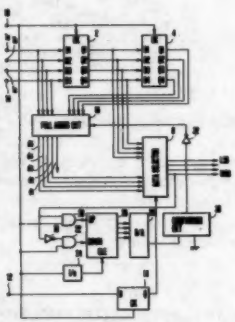
Susumu Kozuki, Tokyo; Masahiro Takei, Kanagawa; Toshiyuki Masui, Kanagawa; Masahide Hirasawa, Kanagawa, and Motokazu Kashida, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1985, Ser. No. 697,399

Claims priority, application Japan, Feb. 7, 1984, 59-20517; Feb. 8, 1984, 59-21087; Feb. 8, 1984, 59-21088; Feb. 22, 1984, 59-31685

Int. Cl.[4] G06F *15/353*

U.S. Cl. 371—31 11 Claims



1. A data processing device, comprising:

(a) input means for inputtng a data sequence consisting of a number of binary data of n bits obtained by sampling an information signal, n being an integer more than 2;

(b) computing means connected to said input means for computing a plurality of binary data included in said data sequence for providing an interpolation data;

(c) rounding means connected to said computing means for raising a fraction which is arranged below a predetermined bit of said interpolation data as a unit one bit above said predetermined bit or cutting away the same thus producing rounded interpolation data;

(d) replace means connected to said input means and said rounding means for replacing an incorrect binary data included in said data sequence with said rounded interpolation data; and

(e) control means for controlling said rounding means so that said raising the fraction to a unit and said cutting away the fraction to a unit by said rounding means are performed alternately every time said replace means replaces said incorrect binary data with said rounded interpolation data.

4,803,685

METHOD AND DEVICE FOR THE TRANSMISSION OF DIGITAL DATA BY MESSAGES ORGANIZED IN FRAMES

Christian Oget, Dravell, France, assignor to Cimsa Sintra, Asnieres, France

Filed Mar. 3, 1987, Ser. No. 21,253

Claims priority, application France, Mar. 6, 1986, 8603133

Int. Cl.[4] G08C *25/02*

U.S. Cl. 371—33 17 Claims

16. A device for data transmission, by messages made up of frames, comprising transmitter and receiver stations designed to work in duplex, wherein each station comprises:

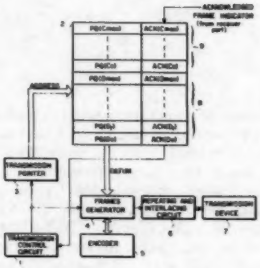
a transmission control circuit included in said transmitter station and coupled to a transmission pointer;

a transmission memory for storing information packets to be transmitted in said frames and for storing an acknowledgement indicator associated with each of said information packets, the input of said transmission memory being coupled to said transmission pointer which addresses said information packets;

a frames generator coupled to the output of said tansmission memory, coupled to said transmission control circuit, and coupled to an encoder which is linked to memory;

a repetition and interlacing circuits coupled to said frame generator's output, said repetition and interlacing circuit being coupled to a transmission device;

a receiver device included in said receiver station and coupled to a reordering circuit;



a correlating circuit coupled to said re-ordering circuit;

a decision circuit functioning by majority vote coupled to the data output of said correlating circuit;

a receiver memory for storing properly-received said information packets and for storing a reception indicator linked to said information packets, the input of said receiver memory being coupled to the validated data output of said decision circuit;

an error-rate measuring circuit linked to the output of said correlating circuit,

a reception control circuit connected to the output of said error-rate measuring circuit, said reception control circuit having outputs which are coupled to said decision circuit and to said reordering circuit, said reception control circuit being connected to transmission memory.

4,803,686

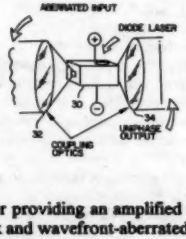
SPATIAL FILTER WITH GAIN

John C. Brock, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 3, 1987, Ser. No. 80,855

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—44 7 Claims



5. Apparatus for providing an amplified uniphase reference beam from a weak and wavefront-aberrated input probe beam, the apparatus comprising:

means for splitting off a portion of the input probe beam;

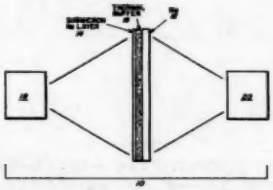
a laser cavity containing a non-linear gain medium and providing a single transverse mode of oscillation;
means for injecting the portion of the input probe beam into the laser cavity to provide four-wave mixing within the cavity; and
means for deriving a uniphase output beam from the laser cavity.

4,803,687

THERMALLY BUFFERED SODIUM-NEON LASER TARGET FOR COHERENT X-RAY PRODUCTION

Frederick Cochran, Alexandria; Jack Davis, Annandale, and John Apruzese, Springfield, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 7, 1985, Ser. No. 795,795
Int. Cl.[4] H01S 3/30
U.S. Cl. 372—5 **6 Claims**



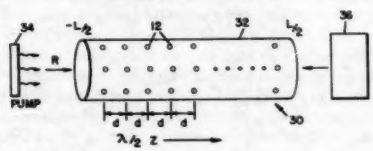
1. A lasing system for generating frequency coherent x-rays, comprising:
a sodium layer;
a first heating means for heating said sodium layer until Na X is present;
a neon layer, wherein said neon layer is kept frozen until laser heating begins;
a second heating means for heating said neon layer until Ne IX is present, so that Ne IX is pumped by Na X to achieve the necessary population for lasing to occur;
a thermal transparent buffer layer located between and in contact with said sodium and neon layers, wherein said buffer layer absorbs thermal waves from said sodium layer and wherein said neon layer is maintained at a lower temperature and density than said sodium layer for lasing to occur; and
means for containing said sodium-buffer-neon layered combination.

4,803,688

ORDERED COLLOIDAL SUSPENSION OPTICAL DEVICES

Nabil M. Lawandy, 52 Humboldt Ave., Providence, R.I. 01906

Filed Mar. 28, 1988, Ser. No. 174,001
Int. Cl.[4] H01S 3/10
U.S. Cl. 372—21 **48 Claims**



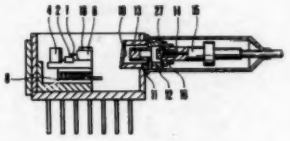
1. An optical apparatus comprising:
means for receiving incident electromagnetic radiation;
means, responsive to at least one characteristic of said received radiation, for modulating said received radiation; and
means for emitting said modulated radiation;
wherein each of said means for receiving, said means for modulating and said means for emitting comprise:
a crystalline colloidal suspension having a lattice structure comprised of a plurality of parallel planes of ordered, electrically charged spheres suspended in an optically active medium, adjacent ones of the planes having a substantially uniform spacing therebetween; and wherein
said optically active medium comprises molecules selected to have a predetermined index of refraction, radiation absorption, radiation emission or a nonlinear optical response property at a wavelength substantially equal to twice the spacing between said planes.

4,803,689

SEMICONDUCTOR LASER MODULE

Naoki Shibanuma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 95,711
Claims priority, application Japan, Sep. 12, 1986, 61-216482
Int. Cl.[4] H01S 3/045
U.S. Cl. 372—36 **5 Claims**



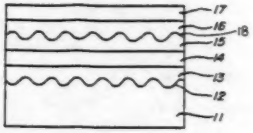
1. A semiconductor laser module, in which a semiconductor laser and a Peltier element for controlling a temperature of said semiconductor laser are mounted in a box shaped metal case, and which has a light-outputting fiber, a portion near distal end of which is protected by a metal cylinder, comprising: said metal case having a window glass which is hermetically sealed in a side wall portion thereof; a substrate fixed on said Peltier element which is fixed in said metal case; said semiconductor laser fixed on said substrate through a chip carrier; a first lens, a light-receiving element, and a thermister fixed on said substrate; a second lens, an outer surface of which is supported by a holder bonded to said side wall around said window glass of said case; and a slide ring having an inner diameter slightly larger than an outer diameter of said metal cylinder, said slide ring being bonded to said holder, and said metal cylinder being bonded to said slide ring.

4,803,690

SEMICONDUCTOR LASER

Haruhisa Takiguchi; Shinji Kaneiwa, both of Nara; Toshihiko Yoshida, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 13, 1986, Ser. No. 839,869
Claims priority, application Japan, Mar. 15, 1985, 60-52606
Int. Cl.[4] H01S 3/09, 3/08
U.S. Cl. 372—45 **2 Claims**



1. In a semiconductor layer comprising a substrate and a

multilayer structure formed on said substrate, said multilayer structure comprising at least a triple-layered structure composed of an active layer for layer oscillation, a pair of optical guiding layers sandwiching said active layer therebetween, and diffraction gratings positioned on the outer side of each of said optical guiding layers, each of said diffraction gratings having a different pitch, the refractive index of each of said optical guiding layers being smaller than that of said active layer, and the bandgap of each of said optical guiding layers being greater than that of said active layer.

4,803,691

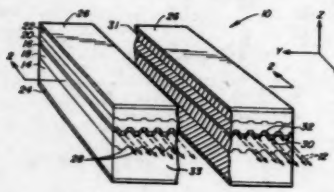
LATERAL SUPERRADIANCE SUPPRESSING DIODE LASER BAR

Donald R. Scifres, San Jose; Heing Kung, Sunnyvale; Peter Cross, Palo Alto, all of Calif.; Robert D. Burnham, Wheaton, Ill., and William Streifer, Palo Alto, Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 731,652, May 7, 1985, abandoned. This application Aug. 28, 1987, Ser. No. 90,333

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—150 **29 Claims**



1. A diode laser bar comprising,

a plurality of semiconductor layers disposed one atop another on a semiconductor substrate, with the layers having a length defining a longitudinal direction, a width defining an edge-to-edge lateral direction and a depth defining a transverse direction, said directions being mutually perpendicular, at least one of said layers forming an active lasing region, said layers being doped to provide a p-n junction adjacent to said active region,

electrode means for supplying current to said active region,

feedback means for providing an optical cavity in the longitudinal direction of said active region, and

active region interrupting means at space apart intervals in said active region for suppressing amplified spontaneous emission in the lateral direction, wherein the lasing region is at least 50 percent of the total active region interrupting means plus said lasing region.

4,803,692

SEMICONDUCTOR LASER DEVICES

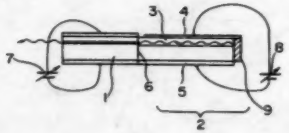
Shinji Sakano, Kokubunji, and Hiroyoshi Matsumura, Saitama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 3, 1986, Ser. No. 903,376

Claims priority, application Japan, Sep. 4, 1985, 60-193742

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—50 **24 Claims**



1. A semiconductor laser device comprising:

a semiconductor laser including a semiconductor active layer formed on a semiconductor substrate and having a pair of light emitting and reflecting end surfaces, thereby defining an internal cavity, and a pair of electrodes operably connected to said semiconductor active layer for allowing a current to flow through the semiconductor active layer;

a resonator having end surfaces which define an external cavity with an optic axis aligned with said semiconductor laser, the resonator being optically coupled to the semiconductor laser, the external cavity of the resonator being in contact with the internal cavity of the semiconductor laser so as to form a junction between said external cavity and said internal cavity, the resonator being made of a material which can electrically change an optical path of said external cavity; and

means coupled to said resonator for electrically controlling the optical path of said external cavity.

4,803,693

DEVICE FOR THE PREPARATION OF A GAS MIXTURE

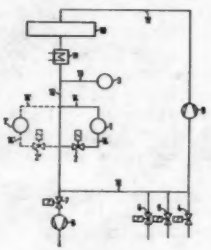
Herbert Schramm, Höchstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 103,408

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633201; Oct. 13, 1986, 3634867

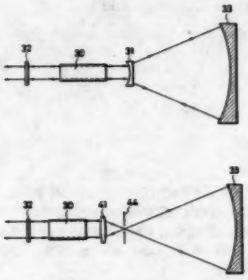
Int. Cl.[4] H01S *3/22*

U.S. Cl. 372—58 **8 Claims**



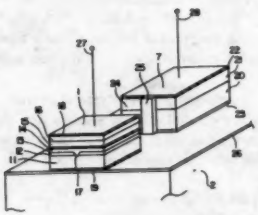
1. In a device for the preparation of a gas mixture including a closed circuit, means for feeding mixture components of a gas mixture with greatly differing partial pressures ranging from low to highest partial pressures to said closed circuit, means for circulating the gas mixture in said closed circuit, means for replenishing at least one of said mixture components with low partial pressure at increasingly shorter intervals, and means for completely exchanging the gas mixture when a given minimal length of the intervals is reached, the improvement comprising at least one branch parallel to a section of said closed circuit conducting the gas mixture substantially completely free of flow losses, said at least one branch including a magnetic valve, a differential pressure sensor in series with said magnetic valve having a total measuring range corresponding to the low partial pressures, said differential pressure sensor controlling the replenishment of the mixture components having the low partial pressure exclusively while said magnetic valve is closed, and an absolute pressure sensor controlling at least the replenishment of the mixture component having the highest partial pressure.

4,803,694
LASER RESONATOR
Chun-Shen Lee, Torrance, and Stanley L. Ream, Laguna Beach, both of Calif., assignors to Amada Company, Limited, Japan
Filed Jul. 8, 1987, Ser. No. 71,155
Int. Cl.[4] H01S 3/13
U.S. Cl. 372—98 9 Claims



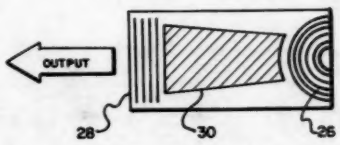
1. A laser resonator having a cavity for the propagation of a laser beam having a wavefront in which a lasing medium is positioned, comprising:
(a) a retro-reflector means including:
(1) optical means disposed in said cavity for expanding the wavefront leaving the lasing medium; and
(2) aspherical concave mirror means disposed in said cavity facing said optical means for reflecting the expanded wavefront toward the lasing medium again and correcting wavefront aberrations induced when the laser beam passes through the lasing medium; and
(b) output coupler means arranged facing said retro-reflector means with the lasing medium positioned within an intracavity formed between said output coupler means and said optical means, for providing feedback for regenerative action of the laser beam.

4,803,695
SEMICONDUCTOR LASER APPARATUS HAVING AN EXTERNAL REFLECTING MEANS
Osamu Yamamoto, Nara; Hiroshi Hayashi, Kyoto, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 13, 1986, Ser. No. 873,991
Claims priority, application Japan, Jun. 14, 1985, 60-130559
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—92 2 Claims



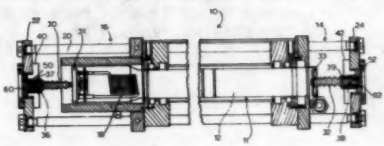
1. A semiconductor laser apparatus comprising a semiconductor laser device and a semiconductor device, both of which are fixed on a single mounting base with a spacing of several mm or less therebetween in such a manner that one of the side faces of said semiconductor device faces a laser-emitting facet of said semiconductor laser device in a parallel manner, the side face of said semiconductor device being a facet, at least a part of which is coated with a reflecting dielectric film functioning so as to have laser light from said semiconductor laser device return to said semiconductor laser device therefrom.

4,803,696
LASER WITH GRATING FEEDBACK UNSTABLE RESONATOR
David M. Pepper, Malibu, and Richard R. Craig, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jun. 30, 1987, Ser. No. 67,893
Int. Cl.[4] H01S 3/08
U.S. Cl. 372—95 16 Claims



1. An unstable resonator laser, comprising:
a gain medium,
a partially reflective output coupler positioned on one side of the gain medium to partially reflect back into the gain medium and partially transmit optical radiation received from the gain medium, and
a reflector positioned on the other side of the gain medium to reflect optical radiation received from the gain medium back into the gain medium,
at least one of said output coupler and said reflector comprising a material capable of supporting an optical spatial grating, and having an optical spatial grating therein which is curved to produce unstable resonation through the gain medium in response to lasing stimulation.

4,803,697
COLD WELDED LASER MIRROR ASSEMBLY
Edwin G. Chaffee, Salt Lake City, Utah, assignor to American Laser Corporation, Salt Lake City, Utah
Filed Nov. 5, 1987, Ser. No. 117,668
Int. Cl.[4] H01S 3/08
U.S. Cl. 372—107 2 Claims



1. A gas laser apparatus, comprising:
(a) a gas laser tube having a bore extending between cathode and anode ends;
(b) said laser tube terminating at each end with a bellows assembly operative to extend the length of the tube bore;
(c) each said bellows assembly comprising:
(i) an adjustably positionable metal bellows secured to a selected end of said tube;
(ii) a tubular pedestal secured at one end to said bellows to form an extension thereof and at the opposite end providing a mirror mount surface;
(iii) a mirror secured to said surface;
(iv) a cold weld material located between said mirror and mirror mount surface; and
(v) retaining means secured to said pedestal encasing the

outer portion of said mirror and operative to apply pressure to said cold weld material to establish a cold weld seal between said mirror and mirror mount surface to retain said mirror on and prevent shifting of said mirror with respect to said mirror mount surface.

4,803,698

ELECTRICALLY HEATED FOREHEARTH

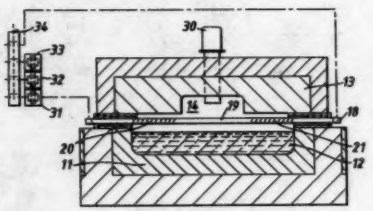
Alan Stephens, South Ruislip, Great Britain, assignor to B.H.F. (Engineering) Limited, Middlesex, England

Filed Sep. 17, 1985, Ser. No. 776,906

Claims priority, application United Kingdom, Sep. 20, 1984, 8423801

Int. Cl.[4] C03B *18/18*

U.S. Cl. 373—27 **1 Claim**



1. In an electrically heated forehearth for molten glass, which forehearth comprises a refractory trough and a refractory roof thereover, there is provided, along the length of the forehearth above the molten glass level in the forehearth, a plurality of radiant heating elements, each element traversing the forehearth substantially at right angles to the direction of glass flow and each element comprising a heating zone at each edge portion and a central, non-heating zone an wherein said roof has a longitudinal substantially central cooling channel and in which the heating zones of each said element extent substantially to under the edges of said channel and the non-heating zone of each said element extends under the channel.

4,803,699

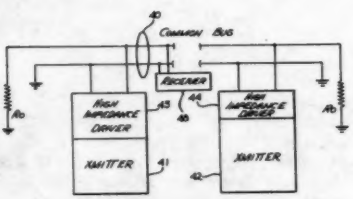
BUS APPARATUS WITH A PLURALITY OF TRANSMITTERS

Martin H. Graham, Berkeley, Calif., assignor to Rolm Corporation, Santa Clara, Calif.

Continuation of Ser. No. 613,025, May 22, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 899,431

Int. Cl.[4] H03K *19/03, 19/94*

U.S. Cl. 375—36 **5 Claims**



1. In an electrical bus apparatus which includes a bus having a characteristic impedance and at least two transmitters coupled onto said bus for transmitting signals on said bus, a method for improving the performance of said bus where a propagation time along said bus between any two of said transmitters is significant compared to a period of transmission cycles used by said transmitters, comprising the steps of:

providing high impedance current drivers between said transmitters and said bus to drive time division multiplexed signals transmitted from said transmitters;

transmitting a first of said time division multiplexed signals onto said bus from a first of said transmitters;

transmitting a second of said time division multiplexed signals onto said bus from a second of said transmitters, while said first signal is still on said bus;

inhibiting signal loss on said bus when both said first and second signals collide on said bus.

4,803,700

METHOD OF, AND DEMODULATOR FOR, DIGITALLY DEMODULATING AN SSB SIGNAL

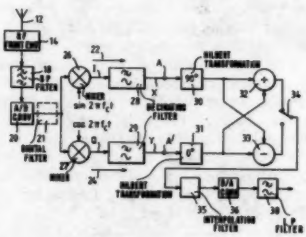
Richard J. Dewey, Reigate, and Christopher J. Collier, Carshalton Beeches, both of England, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 10, 1986, Ser. No. 872,775

Claims priority, application United Kingdom, Jun. 12, 1985, 8514824

Int. Cl.[4] H03D *1/24*

U.S. Cl. 375—77 **9 Claims**



1. An improved method of demodulating an SSB signal, which method comprises:

analog filtering the SSB signal;

subjecting the filtered SSB signal to analog-to-digital conversion at a sampling frequency f_s and to quadrature mixing with a locally generated carrier wave at a frequency $f_c = fs/y$, where y is an integer greater than 1, so as to derive a pair of quadrature-related digital signals;

applying the respective quadrature-related digital signals to respective signal transmission paths in which they are each digitally filtered and decimated; and

combining the decimated digital signals from both of said transmission paths to derive a demodulated digital SSB signal;

such improvement being characterized in that:

the quadrature-related digital signals are digitally filtered and decimated in each transmission path using a decimation factor whichis an odd-numbered integer greater than 1; and

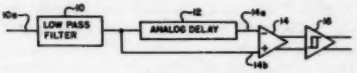
in one of said paths the decimated digital signal therein is thereafter subjected to a Hilbert transform operation producing a −90° phase shift of frequency components thereof which are in an upper sideband extending from fc to +fs/2 and producing a '90° phase shift of frequency components thereof which are in a lower sideband extending from f_c to −fs/2;

whereby the combined demodulated digital SSB signal is derived in a frequency passband which is flanked by frequency stopbands.

4,803,701
DIGITAL DETECTION CIRCUIT

Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 25, 1987, Ser. No. 66,290
Int. Cl.[4] H03K 5/153
U.S. Cl. 375—102 6 Claims



1. A digital pulse detection apparatus comprising in combination:

a low pass filter receiving a digital signal, said low pass filter filtering said digital signal to remove high frequency components therefrom, said low pass filter providing a digital signal output,

a delay unit operatively connected to said low pass filter unit to receive said digital output signal therefrom, said delay unit delaying said digital output signal by a predetermined time to provide a delayed digital signal,

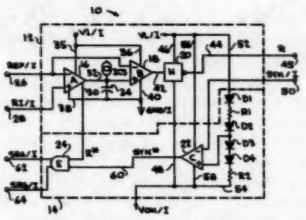
a first differential amplifier unit operatively connected respectively to said low pass filter and said delay unit, said first differential amplifier unit including inverting input and a non-inverting input, said delayed digital signal being applied to said inverting input, said digital signal output being applied to said non-inverting input, said first differential amplifier unit providing a differential output signal, which is defined by the equation, $V_o=K[V(t)-V(t-T)]$, where K is the gain constant for said first differential amplifier unit, V(t) is the present time t input signal, V(t−T) is the signal present at time, t−T, and said differential output signal V_o represents the delta derivative of the input signal which is a measure of the voltage slope in delta V/delta t, and,

a second differential amplifier unit with a voltage hysteresis that may be set to a predetermined value, said second differential amplifier unit operatively connected to said first differential amplifier unit to receive said differential output signal therefrom, said second differential amplifier unit providing a corrected digital output signal.

4,803,702
RESET AND SYNCHRONIZATION INTERFACE CIRCUIT

Shallop J. Chen, Milpitas, Calif., and Jan Johansson, Balsta, Sweden, assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 5, 1986, Ser. No. 893,432
Int. Cl.[4] H04L 7/00
U.S. Cl. 375—106 17 Claims



1. A rest and circuit synchronization interface circuit for use in a subscriber power controller comprising:

resetting means including first comparator means, second comparator means, and network means generating a reset signal at a first node;

said first comparator means being formed of first comparator having hysteresis for comparing an input signal with a reference voltage to produce a first output signal;

said second comparator means being formed of a second comparator for comparing the first output signal from the first comparator with the reference voltage to produce a second output signal;

said network means being responsive to the second signal for inverting and shifting the level of the second output signal to produce the reset signal;

synchronizing means including a third comparator means and an AND logic gate for generating a modified synchronizing signal at a second node;

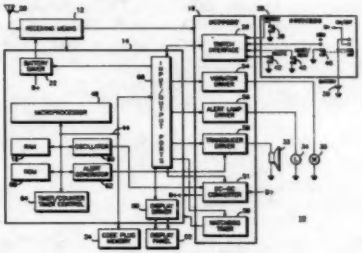
said third comparator means being formed of a third comparator for inverting of a synchronizing clock signal to generate a complementary synchronizing clock signal; and

said logic gate combining logically the first output signal from said first comparator with the complementary synchronizing clock signal to produce the modified synchronizing signal.

4,803,703
APPARATUS AND METHOD FOR FINE SYNCHRONIZATION OF A COMMUNICATION RECEIVER

Michael J. DeLuca, Boca Raton, and David F. Willard, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1987, Ser. No. 44,377
Int. Cl.[4] H04C 7/00
U.S. Cl. 375—116 31 Claims



1. A method for synchronizing a decoding means of a communication receiver, said method comprising the steps of:

(a) receiving digitally encoded signals transmitted to the communication receiver, the digital signals including a bit synchronization signal

(b) synchronizing the decoding means to the bit synchronization signal for generating a timing signal in response thereof;

(c) measuring a phase relationship between the timing signal and a subsequent portion of the received digitally encoded signals; and

(d) adjusting the timing signal on the basis of the measured phase relationship to establish a predetermined phase relationship between the timing signal and the remaining digitally encoded signals.

4,803,704

CIRCUIT ARRANGEMENT FOR THE RECOGNITION OF IMPERMISSABLE PHASE ERRORS IN A PHASE LOCKED LOOP

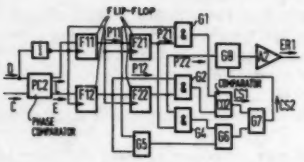
Erik Solhjell, Oslo, Norway, assignor to Tandberg Data A/S, Oslo, Norway

Filed Jul. 6, 1987, Ser. No. 70,191

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643966

Int. Cl.[4] H04L 7/02

U.S. Cl. 375—120 7 Claims



1. A phase-locked loop circuit arrangement for recognition of impermissable phase errors in binary data signals fed to the phase-locked loop, comprising:

an oscillator means for generating clock signals;

means for generating phase signals indicating phase differences between said binary data signals and said clock signals by a phase comparison;

means connected to a control input of said oscillator means for modifying a repetition rate of said clock signals dependent on said phase signals; and

a switching means connected to receive said binary data signals and said phase signals for recognizing impermissable phase errors when two successive phase differences between said binary data signals and said clock signals have directions opposite one another, and for inhibiting said means for modifying the repetition rate of said clock signals given presence of said impermissable phase errors.

4,803,705

ANALOG PHASE LOCKED LOOP

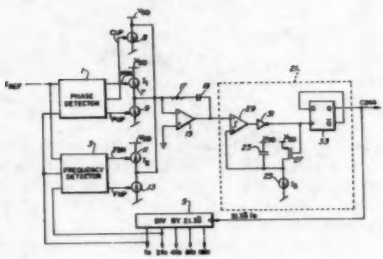
Peter Gillingham, Ottawa, and Jan H. Erkku, Nepean, both of Canada, assignors to Mitel Corporation, Ontario, Canada

Filed Aug. 19, 1987, Ser. No. 87,049

Claims priority, application Canada, Aug. 29, 1986, 517,262

Int. Cl.[4] H03D 3/24

U.S. Cl. 375—120 14 Claims



1. A phase locked loop for synchronizing a local digital signal with a remote digital signal, comprised of:

(a) first means for receiving and comparing said local and remote digital signals, and upwardly adjusting the frequency of said local signal in the event the local signal frequency is less than the remote signal frequency, and downwardly adjusting the frequency of said local signal in the event the local signal frequency is greater than the remote signal frequency,

(b) second means for receiving and comparing said local and remote signals, and upwardly adjusting the frequency of said local signal in the event the local signal phase lags the remote signal phase, and downwardly adjusting the frequency of said local signal in the event the local signal phase leads the remote signal phase, and

(c) means for detecting elongated pulse widths of said remote digital signal and upwardly adjusting the frequency of said local signal in response thereto, for counteracting downward adjustment of the local signal frequency by said first and second means in response to detection of said elongated remote signal pulse widths,

whereby said local and remote signals are phase and frequency locked regardless of pulse width anomalies of said remote signal.

4,803,706

VARIABLE DELAY CHARGE COUPLED DEVICE

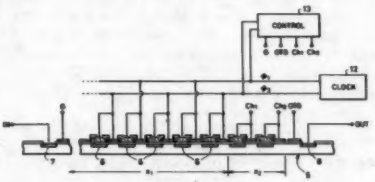
Jin Murayama; Takashi Milda, and Ryuji Kondo, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 9, 1987, Ser. No. 71,682

Claims priority, application Japan, Jul. 9, 1986, 61-159546

Int. Cl.[4] G11C 19/28; H01L 29/78

U.S. Cl. 377—63 4 Claims



1. A CCD delay element, comprising:

a delay stage of a plurality of charge-coupled-device unit cells arranged in a transfer direction;

an adjusting stage of at least one charge-coupled-device unit cell of a same configuration as those of said delay stage and arranged in series with said unit cells of said delay stage;

clocking means for applying clocking signals to said unit cells of said delay stage to transfer data signals along said transfer direction; and

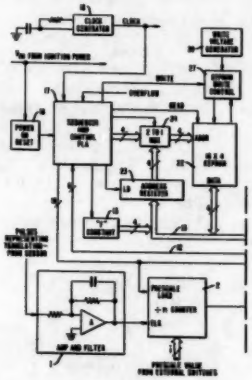
selective means for selectively applying at least one of said clocking signals and a predetermined locking potential to said unit cell of said adjusting stage, said locking potential applied to said unit cell of said adjusting stage causing said unit cell of said adjusting stage to be a conduction channel to transfer said data signals thereacross without delay, said one of said clocking signals applied to said unit cell of said adjusting stage to transfer said data signals thereacross with a delay determined by a period of said clocking signals, whereby said data signals are transferred across said delay stage and said adjusting stage with a selective delay.

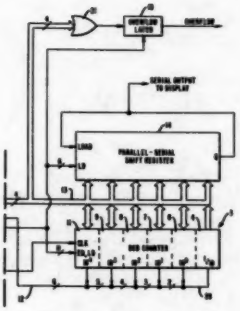
4,803,707

NONVOLATILE ELECTRONIC ODOMETER WITH EXCESS WRITE CYCLE PROTECTION

Ernest W. Cordan, Jr., Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 21, 1987, Ser. No. 135,200
Int. Cl.[4] G01C 22/00
U.S. Cl. 377—24.1 7 Claims





1. A circuit for digitally accumulating and storing odometer information, comprising:

a source of digital signals representing odometer data;

a binary counter configured from volatile electronic devices and operable to accumulate in successive stages information representing digital odometer data;

a nonvolatile memory array which stores at individually addressable locations binary words representing decimal odometer data;

a bus connecting the nonvolatile memory array to the stages of the binary counter;

means for defining a correspondence between a binary counter stage and a nonvolatile memory array addressable location for purposes of reading or writing data;

means for relocating a first addressable location assigned to store binary data representing first decimal value odometer data by generating a first new address from first high value decimal odometer data; and

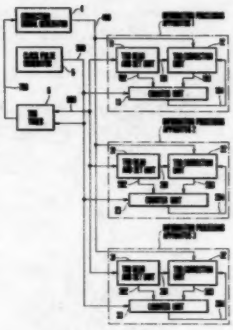
means for relocating a second addressable location assigned to store binary data representing second decimal value odometer data by generating a second new address from second high value decimal odometer data.

4,803,708

TIME-OF-DAY COINCIDENCE SYSTEM

Yuya Momose, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 92,523
Claims priority, application Japan, Sep. 11, 1986, 61-214762
Int. Cl.[4] G06F 11/00
U.S. Cl. 377—28 4 Claims



1. A time of day coincidence system for coinciding time of day values of a plurality of apparatuses, comprising:

clock pulse generating means for generating clock pulses having a predetermined interval;

TOD timer means controlled by the clock pulses;

correction signal generating means for generating a correction signal in a predetermined interval which is a predetermined multiple of the count cycle of said TOD timer means;

said clock pulse generating means, said TOD timer means, and said correction signal generating means being arranged commonly for said apparatuses;

a counter, a count of which is incremented in response to the clock pulse;

reading and setting means for reading out current time of day information from said TOD timer means in response to an external instruction and setting the time of day information in said counter; and

correcting means for correcting the count of said counter in response to the correction signal in accordance with a predetermined rule,

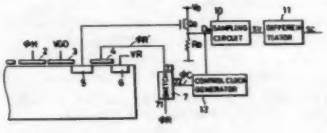
said counter, said reading and setting means, and said correcting means being arranged in each of said apparatuses.

4,803,709

ELIMINATION OF KTC NOISE IN A CHARGE COUPLED DEVICE

Masafumi Kimata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Itamik, Japan

Filed Jul. 27, 1987, Ser. No. 78,198
Claims priority, application Japan, Aug. 29, 1986, 61-204498
Int. Cl.[4] G11C 19/28; H01L 29/78
U.S. Cl. 377—58 17 Claims



1. An output circuit of a charge coupled device comprising a first transistor having a floating diffusion provided to receive

a series of signal charges from a charge transfer section, each signal charge being transferred to the floating diffusion in synchronism with a drive clock applied to the charge transfer section, the first transistor having a gate electrode connected to receive a reset clock ($\phi R'$), and interval means for causing the reset clock (oR') to have an interval longer than the period of the drive clock.

4,803,710

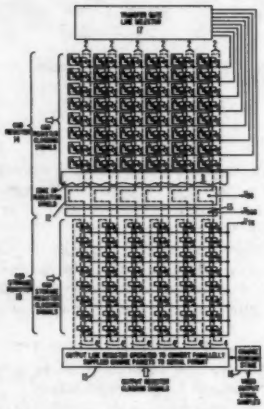
STORAGE REGISTERS WITH CHARGE PACKET ACCUMULATION CAPABILITY, AS FOR SOLID-STATE IMAGERS

Hamman Elabd, Mercer County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 817,536, Jan. 9, 1986, abandoned. This application Mar. 4, 1987, Ser. No. 22,587

Int. Cl.[4] G11C *19/28;* **H01L** *29/78, 27/14, 31/00*

U.S. Cl. 377—60 **17 Claims**



1. A charge-coupled-device (CCD) storage register located along a surface of a substrate of semiconductor material, said CCD storage register comprising:

a first set of CCD charge transfer channels arranged in a first parallel array with intervening spaces, said first set of CCD charge transfer channels having respective input ports in parallel alignment with each other and having respective successions of charge transfer stages arranged in rows;

a second set of CCD charge transfer channels, each located in a respective space adjacent to a corresponding one of said first set of CCD charge transfer channels, with no intermediate charge packet storage locations between any one of said first set of charge transfer channels and the corresponding one of said second set of charge transfer channels, said second set of CCD charge transfer channels having respective successions of charge transfer stages also arranged in said rows and having respective output ports in parallel aligment;

means for parallelly transferring successive lines, or ranks, of charge packets into the input ports of said first set of charge transfer channels;

means for parallelly advancing charge packets in rows of charge transfer stages in said first set of CCD charge transfer channels to suceeding ones of those rows;

transfer gate electrode structures between corresponding ones of said first and second charge transfer channels, receptive of pulsed voltages for selectively transferring ranks of charge packets from ones of the charge transfer stages in each of said first set of CCD charge transfer channels to adjacent charge transfer stages in the same row and in said adjacent one of said second set of CCD channels, which transfer gate electrode structures implement exclusive means for transferring charge packets into said second set of CCD charge transfer channels, the selective transferring taking place between selected ones of the advances of ranks of charge packets in said first set of CCD charge transfer channels; and

means for parallelly advancing each rank of charge packets transferred into said second set of CCD charge transfer channels through said second set of CCD charge transfer channels to be supplied from their output ports.

4,803,711

X-RAY INSPECTION APPARATUS

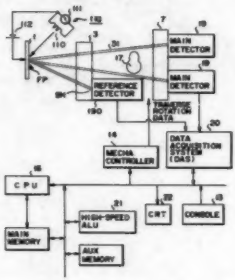
Osamu Tsujii, Fuchu, and Masashi Fujii, Hachioji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 911,100, Sep. 24, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 204,922

Claims priority, application Japan, Sep. 26, 1985, 60-0211034; Sep. 30, 1985, 60-216520

Int. Cl.[4] G01N *23/02;* **G06F** *15/42*

U.S. Cl. 378—4 **14 Claims**



11. An X-ray CT scanner comprising:

X-ray generator means for generating X-ray beams for a given focal point;

main X-ray detector means, facing said given focal point, for detecting an amount of the X-ray beams passing through an object to provide projection data of an object to be inspected; and

reference detector means, facing said focal point, for detecting variations in size of said focal point, and removing errors, contained in said projection data and caused by the focal point size variations, based on the result of the detection of said focal point size variations.

4,803,712

X-RAY EXPOSURE SYSTEM

Yukio Kembo; Minoru Ikeda, both of Yokohama, and Motoya Taniguchi, Kamakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 4,880

Int. Cl.[4] G03F *9/00*

U.S. Cl. 378—034 **25 Claims**

11. An X-ray exposure system comprising:

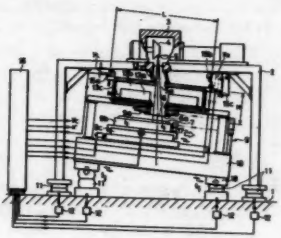
mask-wafer alignment means including a wafer holder for holding a wafer, a mask holder for holding a mask having an exposure pattern, alignment detecting means for detecting a relative displacement between an alignment pattern of the mask and an alignment pattern of the wafer, and alignment means for aligning the wafer and the mask by moving at least one of the wafer holder and the mask holder in accordance with the relative displacement detected by the alignment detecting means;

a supporting base fixedly mounted to and supporting the mask-wafer alignment means;

vibration isolator means for supporting the supporting base to that vibration does not propagate to the mask-wafer alignment means;

a frame set on a floor;

X-ray source means for generating X-rays, said X-ray source means being fixedly provided on the frame so that an



X-ray generated from the X-ray source means is irradiated toward the mask and the wafer;

detecting means for detecting the three dimensional position of the mask-wafer alignment means with respect to the X-ray source means; and

correcting means for correcting for dislocation of the projection of the said exposure pattern on the wafer on the basis of position data detected by the detecting means.

4,803,713

X-RAY LIGHOGRAPHY SYSTEM USING SYNCHROTRON RADIATION

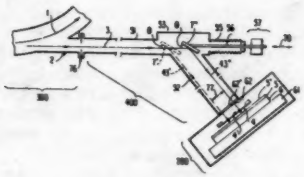
Kiyoshi Fujii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 5, 1987, Ser. No. 116,816

Claims priority, application Japan, Nov. 5, 1986, 61-261830

Int. Cl.[4] G21K *5/00, 5/10*

U.S. Cl. 378—34 **4 Claims**



1. An X-ray lithography system using synchrotron radiation including X-rays, said system comprising a beam line structure and an X-ray lithography exposure apparatus, said beam line structure including a first line portion extending in a first direction, a second line portion extending in a second direction inclined from said first direction, a chamber connecting said first and second line portions, a mirror for reflecting said X-rays provided in said chamber, and a means for moving said mirror in said first direction while keeping a constant angle from said first direction, whereby X-rays traveling in said first direction within said first line portion are reflected by said mirror to said second direction and travel within said second line portion and said X-rays within said second line portion can be scanned in a third direction perpendicular to said second direction in correspondence with the movement of said mirror in said first direction by said means, and said X-ray lithography exposure apparatus being positioned at the end of said second line portion of said beam line structure and including an X-ray mask provided along said third direction such that said scanning X-rays irradiate perpendicularly to the surface of said mask in all exposure areas of said mask.

4,803,714

METHOD FOR FORMING A RADIOGRAM USING SLIT-SCANNING RADIOGRAPHIC TECHNIQUES

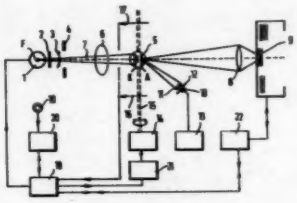
Hugo Vlasbloem, Maasland, Netherlands, assignor to B. V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Sep. 7, 1984, Ser. No. 648,707

Claims priority, application Netherlands, Sep. 13, 1983, 8303156

Int. Cl.[4] G01N *23/04*

U.S. Cl. 378—62 **1 Claim**



1. A method for forming a radiogram of an object, which comprises the steps of:

(a) energizing an X-ray source to a low level of radiation intensity, said X-ray source including a slit diaphragm;

(b) pivoting said X-ray source during a first scanning of said object;

(c) moving an elongated X-ray detector along a position corresponding to a position of said X-ray source during said first scanning thereby to generate output signals of radiation intensity;

(d) measuring said output signals during at least a portion of said first scanning;

(e) energizing said X-ray source to a higher level of radiation intensity as determined by step (d) to form a radiogram;

(f) pivoting said X-ray source during a second scanning of said object at said higher level of radiation intensity;

(g) moving said elongated X-ray detector along said position corresponding to said position of said X-ray source during said second scanning thereby to generate second output signals of radiation intensity; and

(h) forming said radiogram from said second output signals.

4,803,715

THICKNESS MEASUREMENT WITH AUTOMATIC CORRECTION FOR CHANGES IN COMPOSITION

Boong Y. Cho, Columbus, Ohio, assignor to Process Automation Business, Inc., Columbus, Ohio

Filed Oct. 10, 1986, Ser. No. 918,162

Int. Cl.[4] G01B *15/02*

U.S. Cl. 378—90 **9 Claims**

9. An apparatus for measuring the thickness of a sheet of metal alloy, which apparatus is calibrated with samples of a reference alloy, and which sheet has a composition that may vary from the reference alloy, comprising:

means positioned on one side of the sheet for irradiating the sheet with X-rays;

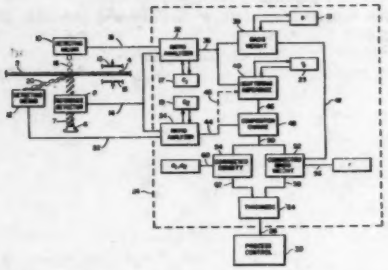
means positioned on the one side of the sheet for detecting X-rays that are emitted by the irradiating means to produce a reference signal expressive of the intensity of emitted X-rays;

means positioned on the opposite side of the sheet for detecting X-rays that are transmitted through the sheet to produce a transmission signal expressive of the intensity of transmitted X-rays;

means positioned on the one side of the sheet for detecting

X-rays that are backscattered by the sheet to produce a scattering signal expressive of the intensity of backscattered X-rays;

signal processing means, responsive to the reference, transmission, and scattering signals, with means for producing a thickness response expressive of the thickness of the sheet, the magnitude of which thickness response depends upon the degree to which a ratio response differs from a



comparison response, wherein the signal processing means comprises means to produce the ratio response in response to the reference and scattering signals, and means to produce the comparison response in response to the reference and transmission signals, and wherein the comparison response indicates what the ratio response should be if the composition of the sheet is equal to the reference alloy.

4,803,716

X-RAY DIAGNOSTICS INSTALLATION FOR RADIOGRAPHS

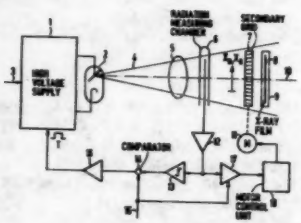
Ernst Ammann, Bubenreuth, and Paul Marhoff, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 21, 1987, Ser. No. 75,995

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625856

Int. Cl.[4] G21K *1/02*

U.S. Cl. 378—155 **1 Claim**



1. An x-ray diagnostics installation comprising:

means for generating an x-ray beam having a central ray directed at an examination subject;

x-ray film disposed in the path of said x-ray beam after said examination subject for recording radiation from said means for generating attenuated by said examination subject;

means disposed between said examination subject and said x-ray film for generating an electrical signal corresponding to the exposure time;

a secondary radiation grid also disposed between said examination subject and said x-ray film having lamellae;

means for moving said secondary radiation grid perpendicularly with respect to said central ray of said x-ray beam; and

control means for controlling the speed of movement of said secondary radiation grid dependent on said exposure time including means for integrating said signal corresponding to the exposure time, and wherein said signal corresponding to said exposure time is also supplied as a control signal for said means for moving said secondary radiation grid, such that the speed of said secondary radiation grid is controlled for all exposure times to avoid imaging said lamellae of said secondary grid on said x-ray film.

4,803,717

AUTOMATIC ANSWERING TELEPHONE WITH MEMORY STORAGE HAVING STORAGE INDICATION AND AN ALARM

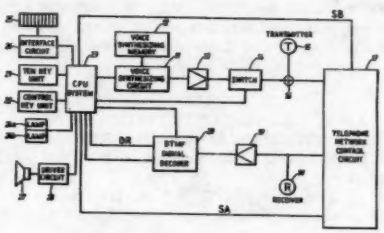
Kuniyoshi Marui, Tokorozawa, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 757,868

Claims priority, application Japan, Jul. 30, 1984, 59-157232

Int. Cl.[4] H04M *1/65*

U.S. Cl. 379—67 **26 Claims**



1. In a telephone system automatically responsive to transmitted DTMF signals containing information received from a calling originator, the method of receiving and processing said signals for storing said information in a memory of the telephone system, said information comprising at least one characteristic of the calling originator, comprising the steps of:

determining the number of vacant areas within said memory available for storing said information;

generating and transmitting a synthesized voice message corresponding to a first predetermined response message to the calling originator to request said calling originator to transmit DTMF signals if there are vacant areas available for storage;

receiving said transmitted DTMF signals;

generating a synthesized voice message corresponding to said received signals;

transmitting said synthesized voice message to said calling originator for confirmation of said DTMF signals received from said calling originator;

displaying the number of vacant areas available for storage; and

storing said received information in said memory if there are vacant areas available for storage, said stored information being selectively read in any order as required by a user of the telephone system; and

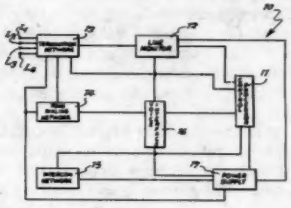
automatically generating and transmitting a synthesized voice message corresponding to a second predetermined response message to said calling originator if there are no vacant areas available for storage.

4,803,718

HOLD DETECTING AND CONTROL CIRCUIT FOR A KEY TELEPHONE SYSTEM

James E. Neil, Buffalo; Victor Demjanenko, North Tonawanda, and Christopher R. Calle, Williamsville, all of N.Y., assignors to Tree Technologies Corporation, Williamsville, N.Y.

Filed Mar. 6, 1987, Ser. No. 22,890
Int. Cl.[4] H04M *1/00, 9/06*
U.S. Cl. 379—163 65 Claims



1. A hold detecting circuit for a key telephone system, for determining a telephone line state of on-hook, hold, or off-hook, comprising:

means for periodidally detecting a line voltage to obtain a detected line voltage;

means for determining a representative stable on-hook line voltage using detected voltge obtained when the telephone line is in an on-hook state;

means for storing the value of said stable on-hook line voltage;

means for determining a representative stable off-hook line voltage using detected voltage obtained when the telephone line is in an off-hook state;

means for storing the value of said stable off-hook line voltage;

means for calculating a first transition threshold voltage separating off-hook and hold line states using the stored stable on-hook and stable off-hook voltages and known system constants;

means for calculating a second transition threshold voltage separating hold and on-hook line states using the stored stable on-hook and stable off-hook voltages and known system constants; and

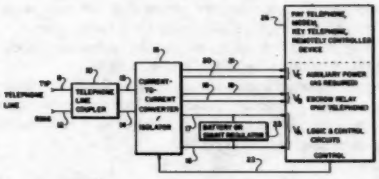
means for comparing said detected line voltage with said first and second threshold voltages to determine off-hook, on-hook and hold line states.

4,803,719

METHOD FOR POWERING TELEPHONE APPARATUS AND TELEPHONE APPARATUS POWERED DIRECTLY FROM THE TELEPHONE LINE WITHOUT EXTERNAL POWER

Thomas J. Ulrich, 14 Brookfield Rd., Binghamton, N.Y. 13903

Filed Jun. 4, 1987, Ser. No. 58,253
Int. Cl.[4] H04M *19/00*
U.S. Cl. 379—399 25 Claims



1. A telephone apparatus powered directly from a telephone line, comprising:

a telephone device;

means, connectable with first and second conductors of a telephone line, for limiting current drawn from said telephone line, and for producing a constant current output;

a transformer including a primary winding and at least one secondary winding connected to said telephone device, said at least one secondary winding being electrically isolated from said primary winding;

switching means, connected to said constant current output, for alternately connecting and disconnecting said constant current output to and from said primary winding at a substantially constant frequency and duty cycle; and

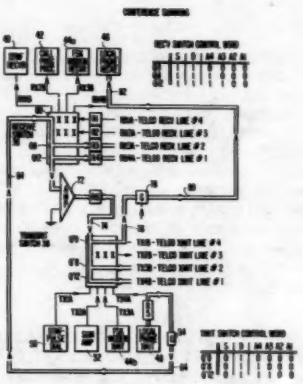
means connected across one of said at least one secondary winding for regulating voltages on all windings of said transformer and for producing regulated output voltages corresponding to respective ones of said at least one secondary winding.

4,803,720

DUAL PLANE CROSS POINT SWITCH ARCHITECTURE FOR A MICRO-PBX

Darryl C. Newell, Boca Raton, Fla.; Karl F. Schroeder, Gaithersburg, and Bruce J. Wilkie, Ijamsville, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 22, 1986, Ser. No. 910,055
Int. Cl.[4] H04M *3/56*
U.S. Cl. 379—202 1 Claim



1. In a micro-PBX system, a telephone switching network for interconnecting a plurality of dissimilar shared telephone resource units, comprising:

a software reconfigurable cross point switch having a first switching plane for interconnecting a first subplurality of shared telephone resource units and having a second, idependently switched switching plane for selectively interconnecting a second subplurality of shared telephone resource units;

a stored program data processing means having an input-/output bus connected to a control input of said cross point switch, for selectively setting the switching state of switching elements in said first and said second switching planes thereof;

said send and the receive paths in a telephonic communications session being independently switched between respective ones of said shared telephone resource units;

at least two telephone receive lines connected through respective build-out resistors to a common node in said first switching plane;

a summing amplifier having an input connected to said common node in said first switching plane and an output

connected through an impedance device to an input node of said second switching plane;

said input node of said second switching plane being connected to transmit lines associated with said receive lines;

whereby the analog signals on said receive lines can be algebraically summed for telephone conference communications.

4,803,721

DC CONTROL CIRCUIT

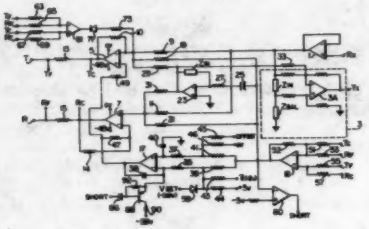
Pierre J. Schingh, Gatineau, Canada, assignor to Mitel Corp., Kanata, Canada

Filed Dec. 2, 1987, Ser. No. 127,902

Claims priority, application Canada, Dec. 24, 1986, 526334

Int. Cl.[4] H04M *9/00*

U.S. Cl. 379—399 **10 Claims**



1. In a telephone interface circuit including tip and ring lead differential driver circuits connected via respective output resistors to tip and ring terminals for carrying nominal DC line voltages, the improvement comprising a DC control circuit comprised of means for comparing the DC voltage carried by said tip terminal with a predetermined DC offset voltage, and in response generating and applying a DC bias signal to each of said tip and ring terminals via respective ones of said driver circuits, such that the DC voltages carried by said tip and ring terminals are maintained at respective predetermined levels offset from said nominal voltages by an amount equivalent to said predetermined DC offset voltage.

4,803,722

CIRCUIT FOR REMOTE SUPPLY OF SUBSCRIBER LINE TERMINALS IN A TELECOMMUNICATION SYSTEM

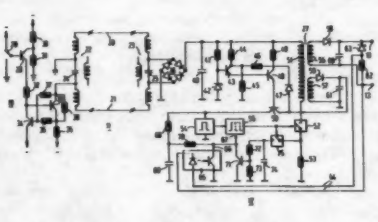
Harald Schreiber, Salzkotten, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Apr. 10, 1986, Ser. No. 849,977

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 3513625

Int. Cl.[4] H04M *19/00*

U.S. Cl. 379—413 **20 Claims**



1. An improved circuit for remotely supplying electrical power to subscriber line terminals in a telecommunication system, from a central source of electrical current by way of a supply circuit and a subscriber line, wherein each terminal is connected to the subscriber line by a switching current converter having a primary side and a primary side energy reservoir connected to the subscriber line so as to supply power to the current converter, said switching current converter being switchable between an on and off state in response to a switching signal and supplying a preselected level of current, wherein the improvement comprises:

said switching current converter having an output voltage and including a control circuit for controlling the switching of said converter in accordance with said output voltage, said control circuit including means for generating a control signal for controlling the switching of said converter, said control signal having a rising flank of finite slope when said converter is switched on and possessing characteritistics to prevent said preselected current level from being exceeded,

said converter further including a switching circuit having a primary side controlled by switching pulses, and

said control circuit including a voltage controlled pulse width modulator for generating said switching pulses, and means for controlling the voltage applied to said modulator, said voltage controlling means including a resistance and a capacitance arranged as a delay circuit.

4,803,723

TELEPHONE

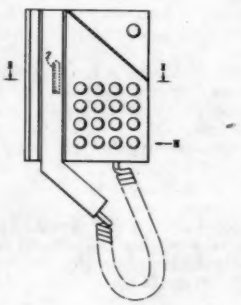
Gordon Willis, St Albans, Great Britain, assignor to STC PLC, London, United Kingdom

Filed Oct. 16, 1987, Ser. No. 109,107

Claims priority, application United Kingdom, Dec. 24, 1986, 86 30895

Int. Cl.[4] H04M *1/08*

U.S. Cl. 379—424 **4 Claims**



1. A telephone subscriber's instrument, which includes;

an instrument body with a recess of generally rectangular cross-section in the instrument body;

a handset a substantial part of the length of which is of generally rectangular cross-section and so proportioned that the handset fits smoothly into the recess;

an upstanding locating member in the bottom of the recess and a blind hole in the handset which fits over the upstanding locating member when the handset is in the recess, so as to locate said handset in the recess;

hook-switch contact means within the instrument body and adjacent to one side of the recess; and

a pivotted member located in an upright side with respect to the bottom of the recess, said pivotted member mounted in the instrument body with a portion of said pivotted member extending into said recess;

wherein:

when the handset is fitted into said recess with its blind hole over said upstanding member the side of the handset rocks said pivotted member about its pivot point in such a direction as to operate said contact means against spring ur-

gence into the on hook condition of said contact means; and

wherein when the handset is removed from said recess said spring urgence drives the contact means to its off-hook condition and causes the pivotted member to pivot about its said pivot point to its off-hook condition.

4,803,724

HAND SET

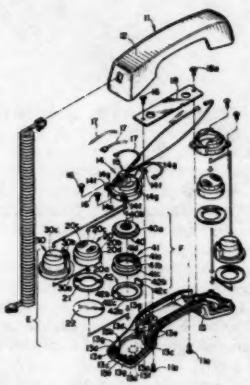
Yoshihiro Utoh, Hino, and Koichiro Suda, Fuchu, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 24, 1987, Ser. No. 17,702

Claims priority, application Japan, Feb. 28, 1986, 61-28758[U]

Int. Cl.[4] H04M *1/03*

U.S. Cl. 379—433 **13 Claims**



1. A hand set, comprising:

a case including a talk sending surface having a plurality of sound holes therein and a first fastenable portion disposed proximate said talk sending surface;

a holder including a second fastenable portion and means for firmly placing in the alternative on said talk sending surface of said case both a pressure contact set type sender assembly and a float set type sender assembly, said holder having a cavity with an upper part which accommodates the placed one of said pressure contact set type sender assembly and said float set type sender assembly; and

fastening means for fastening said first and second fastenable portions together and for clamping said placed one of said pressure contact set type sender assembly and said float set type sender assembly between said placing means of said holder and said talk sending surface of said case.

4,803,725

CRYPTOGRAPHIC SYSTEM USING INTERCHANGEABLE KEY BLOCKS AND SELECTABLE KEY FRAGMENTS

Donald R. Horne, Don Mills, and John M. Jeffers, Downsview, both of Canada, assignors to General Instrument Corp., New York, N.Y.

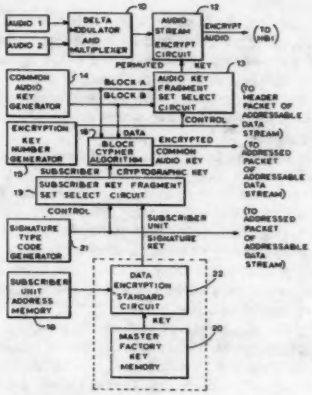
Division of Ser. No. 710,385, Mar. 11, 1985, Pat. No. 4,694,491. This application May 14, 1987, Ser. No. 50,635

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[4] H04L *9/02*; H04K *1/06*; H04N *7/167*

U.S. Cl. 380—44 **35 Claims**

21. A receiver for use in a system broadcasting information of the type comprising a key having more than one key fragment, the key fragments having been arranged in a selected order to form a permuted key, data indicative of the selected order of the key fragments in the permuted key, and information encrypted using the permuted key, the receiver comprising means for receiving the key, data and encrypted information, means for obtaining the permuted key from the received



key in accordance with the received data and means for decrypting the received information using the obtained permuted key.

4,803,726

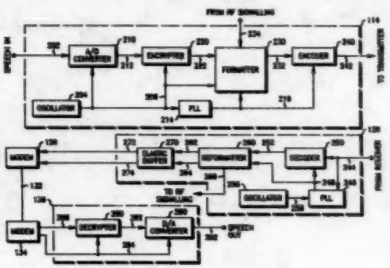
BIT SYNCHRONIZATION METHOD FOR A DIGITAL RADIO TELEPHONE SYSTEM

Stephen N. Levine, Itasca; Larry C. Puhl, Sleepy Hollow; Harry M. Blias, and Gerald E. Corrigan, both of Chicago, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1986, Ser. No. 948,199

Int. Cl.[4] H04K *1/02*; H04L *7/00*

U.S. Cl. 380—48 **52 Claims**



22. A method of maintaining continuous bit synchronization of digitally encrypted speech transmitted over both landline and radio frequency (RF) data transmission paths between a land station and a remote station through a base station, said bit synchronization in the remote station:

converting an analog input speech signal into digital speech data to provide an input data stream having a first bit rate;

encrypting said input data stream to provide an encrypted data stream;

interleaving a predetermined number of data bits of said encrypted data stream with a plurality of predetermined signalling words to provide a combined data message having a second bit rate;

encoding said combined data message into a digital format;

transmitting said encoded data message via said RF transmission path;

in the base station:

receiving said transmitted data message from said RF transmission path;

phase-locking a clock signal to said received data message and clocking said received data message through subsequent steps with said phase-locked clock signal;

decoding said received data message;

correlating said signalling words of said received data message with known signalling words to provide a correlation detect signal;

counting a number of data bits of said received data message occurring after said correlation detect signal until said predetermined number of data bits have been counted;

separating said counted number of data bits from said received data message to provide a plurality of separated data words having an instantaneous bit rate corresponding to said phase-locked clock signal;

buffering said separated data words to provide a continuous data stream at said first bit rate;

adjusting the clock rate of said continuous data stream to meet predetermined data rate tolerance requirements of landline transmission equipment;

transmitting said adjusted data stream via said landline transmission path;

in said land station:

receiving said tansmitted data stream from said landline transmission path;

decrypting said received data stream and

converting said decrypted data stream into an analog signal, thereby reconstructing said input speech signal.

4,803,727

TRANSMISSION SYSTEM

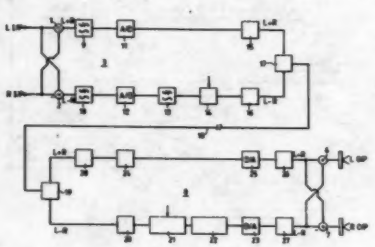
Christopher E. Holt, and John M. Rollett, both of Ipswich, England, assignors to British Telecommunications public limited company, Great Britain

Filed Nov. 24, 1987, Ser. No. 124,512

Claims priority, application United Kingdom, Nov. 24, 1986, 8628046

Int. Cl.[4] H04S 1/00

U.S. Cl. 381—1 **17 Claims**



1. A transmission system for audio signals in which at a transmitter: a monphonic signal and a difference signal are derived from multiple input signals, a digital version of the difference signal is bandlimited to a predetermined bandwidth smaller than that of the monophonic signal, the sampling rate of the digital bandlimited difference signal is reduced; and the monophonic and resulting difference signals are transmitted to a receiver; and in which at a receiver: upon reception, the sampling rate of the digital difference signal is increased, frequencies above the predetermined bandwidth in the difference signal are attenuated, and left and right output signals are derived from the monophonic and resultant difference signals; and in which, either at the transmitter or receiver, compensation for differential delays in the monophonic and difference signals is introduced.

4,803,728

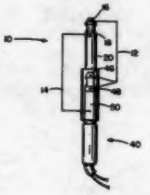
STEREO MIXING JACK

Jeffrey A. Lueken, 514 Rolling Hills Dr., NW., Bemidji, Minn. 56601

Filed Jun. 23, 1987, Ser. No. 65,507

Int. Cl.[4] H04S 1/00

U.S. Cl. 381—25 **2 Claims**



1. An apparatus for use between the output of a stereophonic source having a left channel, right channel and common ground outputs, and the input of a headphone set having a standard headphone set plug with corresponding left channel, right channel and common ground inputs, to suppress lead instrumental and vocal audio signals, comprising:

(a) an adapter having a male plug portion and a female receptacle portion;

(b) said male plug portion adapted to mate with the output of the stereophonic source, said male plug portion having first, second, and third electrical conductivity connections corresponding respectively to the left channel, right channel and common ground outputs of the stereophonic source;

(c) said female receptacle portion being adapted to receive the standard headphone set plug, said female portion being in electrical communication with said male plug portion;

(d) said adapter having electrical paths constructed and arranged to electrically connect said male plug portion to the input of the headphone set when the headphone set plug is received by said female receptacle,

wherein one said electrical path electrically connects said first conductivity connection of said male plug to the left and right channel inputs of the headphone set; and

(e) a second electrical path electrically connects said second conductivity connection of said male plug to the common ground input of the headphone set.

4,803,729

SPEECH RECOGNITION METHOD

James K. Baker, West Newton, Mass., assignor to Dragon Systems, Inc., Newton, Mass.

Filed Apr. 3, 1987, Ser. No. 34,843

Int. Cl.[4] G10L 5/00

U.S. Cl. 381—43 **29 Claims**

1. A method of speech labeling comprising:

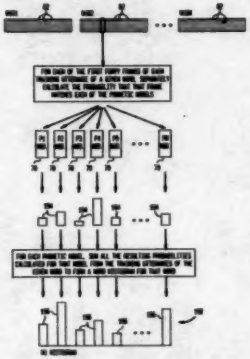
representing speech to be labeled as a sequence of acoustic frames;

storing a plurality of acoustic frame models, each of which represents a certain class of sounds, with the acoustic models representing at least twenty different phonetic classes of sound;

storing a plurality of transition probabilities, each of which indicates the probability that a frame associated with a first acoustic model will neighbor a frame associated with a second, but not necessarily different, acoustic model;

associating one or more of the acoustic models with a given frame as a function of (a) the closeness with which the given frame compares to each of a plurality of the acoustic models, (b) an indication of which one or more of the acoustic models most probably correspond with a frame

which neighbors the given frame, and (c) one or more transition probabilities which indicate, for one or more acoustic models associated with the neighboring frame, the probability that the given frame is associated with a given acoustic model; and



labeling each frame in said sequence of acoustic frames with a label identifying said one or more associated acoustic models.

4,803,730

FAST SIGNIFICANT SAMPLE DETECTION FOR A PITCH DETECTOR

David L. Thomson, Aurora, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 31, 1986, Ser. No. 926,013
Int. Cl.[4] G10L 1/00
U.S. Cl. 381—49 16 Claims

1. An apparatus responsive to a digitized signal comprising a plurality of segments each having a plurality of samples for determining a set of significant samples from said digitized signal, comprising:

means for searching in reverse order through said samples of one of said segments to determine a set of candidate samples; and

means for searching in a forward order through said set of candidate samples to determine a set of significant samples for said one of said segments.

4,803,731

REVERBATION IMPARTING DEVICE

Koji Niimi; Yuji Kakubo, and Yuji Ikegaya, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

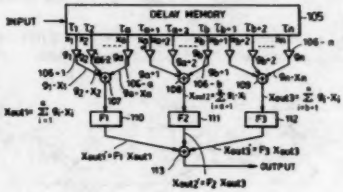
Continuation of Ser. No. 643,076, Aug. 22, 1984, abandoned.
This application Aug. 24, 1987, Ser. No. 89,907
Claims priority, application Japan, Aug. 31, 1983, 58-161065; Aug. 31, 1983, 58-161066; Aug. 31, 1983, 58-161067
Int. Cl.[4] H03G 3/00
U.S. Cl. 381—63 12 Claims

1. A reverberation imparting device comprising:

a single delay memory receiving and storing samples of input signal data in different memory locations;

addressing means for causing the delay memory to be addressed to read out a plurality of delay signals corresponding to predetermined delay times;

adjusting means for controlling the operation of the addressing means to cause different memory locations to be addressed to collectively alter said predetermined delay times by a common factor;



addition means for adding a first group of said delay signals to produce a first added signal and adding a second group of said delay signals to produce a second added signal; and

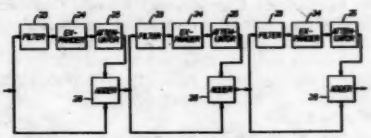
output means for receiving and electrically adding the added signals and outputting a single reverberation signal.

4,803,732

HEARING AID AMPLIFICATION METHOD AND APPARATUS

Harvey A. Dillon, 17 Chakola Ave., Hornsby Heights, New South Wales 2077, Australia

PCT No. PCT/AU84/00223, § 371 Date Jun. 17, 1985, § 102(e) Date Jun. 17, 1985, PCT Pub. No. WO85/02085, PCT Pub. Date May 9, 1985
PCT Filed Oct. 25, 1984, Ser. No. 758,557
Claims priority, application Australia, Oct. 25, 1983, PG2040
Int. Cl.[4] H04R 25/00; H03G 5/00, 7/00, 9/20
U.S. Cl. 381—68.2 13 Claims



1. A method of amplifying a signal received by a microphone of a hearing aid, said method comprising the steps of:

(a) compressing the output signal from the microphone;

(b) dividing the compressed signal into a plurality of separate frequency bands within a hearer's frequency range;

(c) expanding the signal within each separate frequency band;

(d) combining the expanded signals of each separate frequency band; and

(e) modifying the combined signal by a signal which is derived from the envelope of the output signal from the microphone.

4,803,733

LOUDSPEAKER DIAPHRAGM MOUNTING SYSTEM AND METHOD

Robert W. Carver, 330 Ave. "A", Snohomish, Wash. 98290, and James J. Croft, 911 N. 68th St., Seattle, Wash. 98103

Filed Dec. 16, 1986, Ser. No. 942,879
Int. Cl.[4] H04R 9/06, 7/02, 7/20, 31/00
U.S. Cl. 381—193 18 Claims

1. A speaker apparatus comprising:

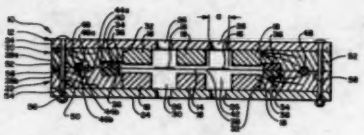
(a) A perimeter frame defining a middle sound producing area and having an edge mounting portion,

(b) a planar flexible diaphragm having an edge section con-

nected to the edge mounting portion of the frame and a middle sound producing section with at least one electrically conductive element thereon, positioned in the sound producing area defined by the frame,

(c) a magnet means mounted to the frame and positioned to create a magnetic field in the sound producing area to interact with said conductive element to cause the sound producing portion of the diaphragm to move back and forth,

(d) said edge mounting portion of the frame having a tensioning groove means extending along at least part of the



edge mounting portion of the frame and receiving therein a portion of the edge section of the diaphragm

(e) an elongate tensioning member positioned at said tensioning groove means and extending along said portion of the edge section of the diaphragm to press said portion of the edge section of the diaphragm into the tensioning groove means and thus tension the diaphragm, and

(f) said perimeter frame being arranged with pressing means to press the elongate tensioning member at least partially into the tensioning groove means, to obtain a desired tensioning over the sound producing section of the diaphragm.

4,803,734

METHOD OF AND APPARATUS FOR DETECTING PATTERN DEFECTS

Hiroyuki Onishi, Otsu; Tetsuo Sano; Tetsuo Hoki, both of Kyoto; Eiji Kodama, Higashiosaka; Hisayuki Tsujisaka, and Ryuji Kitakado, both of Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 10, 1986, Ser. No. 940,272

Claims priority, application Japan, Dec. 13, 1985, 60-281558

Int. Cl.[4] G06K 9/64

U.S. Cl. 382—8 **14 Claims**

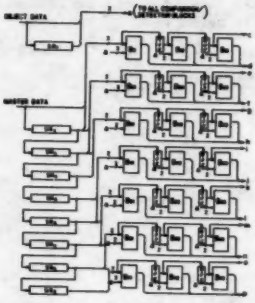
1. A method of detecting pattern defects by comparing a unit area of a two-dimensional object pattern, said unit area having a prescribed size and formed by digitized picture signals obtained sequentially along scanning lines, with a plurality of areas of a digitized two-dimensional master pattern, said method comprising the steps of:

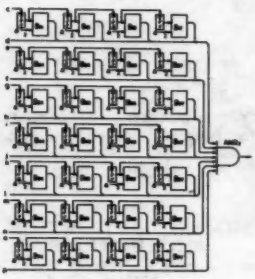
defining a reference area by expanding the periphery of an area of said master pattern to positionally correspond to an area of said object pattern expanded by a predetermined number of pixels for defining said plurality of said master pattern areas, each of said master pattern areas being two-dimensionally misregistered pixel-by-pixel by prescribed different amounts over the expanded area; and

comparing the digitized signals of said master pattern areas with the digitized signals of said unit area of said object pattern corresponding to said master pattern areas to perform defect detection by:

(a) while scanning defect inspection windows, sized to contain a plurality of pixels, over said unit area of said object pattern and said master pattern areas, comparing each one of said plurality of master pattern areas with said unit area of said object pattern to determine for each pair-wise comparison that said patterns are mismatched when all digitized signals representing corresponding pixels included in said windows are mismatched in any scanning position;

(b) determining that said object pattern is defective when said object pattern area is determined to be mismatched with respect to each one of said plurality of master pattern areas; and





(c) determining that said object pattern is not defective when said object pattern area is determined not to be mismatched with respect to at least one of said master pattern areas.

4,803,735

METHOD AND APPARATUS FOR CALCULATING POSITION AND ORIENTATION BY COMBINATION OF FEATURES OF PARTIAL SHAPES

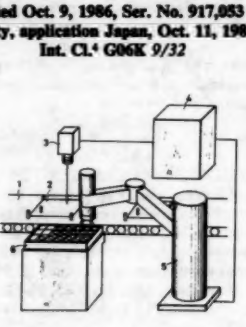
Yoshie Nishida, Yokohama; Seiji Hata, Fujisawa, and Masao Tsuji, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 9, 1986, Ser. No. 917,053

Claims priority, application Japan, Oct. 11, 1985, 60-224857

Int. Cl.[4] G06K 9/32

U.S. Cl. 382—8 **9 Claims**



1. A position and orientation calculating method comprising the steps of:

inputting a two-dimensional picture image of an object article obtained from an image detector;

extracting at least two two-dimensional images from at least two windows defining image processing ranges corresponding to two portions of the object article in accordance with coordinates of each of said two windows, and extracting data describing coordinates of a sequence of points from a sequence of segments approximated as a polygon for an image designating a contour of a portion of the object article between each of said two windows;

calculating a center of gravity from said data with respect to a pattern adapted for extraction of an entirety of a partial shape from said two two-dimensional images and calculating a straight line by a linear equation from said data with respect to the pattern adapted for extraction of the partial shape from said windows; and

calculating calculated data describing position and orientation of the object article from said center of gravity and calculating the orientation of said object article from a combination of said center of gravity and the intersection of said straight line and a perpendicular line extending thereto from said center of gravity.

4,803,736

NEURAL NETWORKS FOR MACHINE VISION

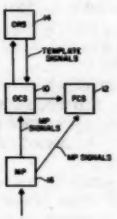
Stephen Grossberg, Newton Highlands, and Ennio Mingolla, Newton, both of Mass., assignors to The Trustees of Boston University, Boston, Mass.

Continuation-in-part of Ser. No. 802,777, Nov. 27, 1985, abandoned. This application Jul. 23, 1987, Ser. No. 102,018

Claims priority, application PCT Int'l Appl., Nov. 26, 1986, PCT/US86/02556

Int. Cl.[4] G06K 9/48

U.S. Cl. 382—22 **7 Claims**



1. A Boundary Contour System for detecting the boundaries of images having contrast distribution comprising:

(a) mask means responsive to signals corresponding to said contrast distribution for weighting such signals with an orientational weighting function to produce mask output signals proportional to the degree of orientational congruence between the weighting function and the contrast distribution;

(b) node means responsive to said mask output signals for enhancing said mask signals by suppressing the strength of mask output signals emanating from regions of the image of homogeneous contrast distribution to produce enhanced orientational mask signals;

(c) feedback means responsive simultaneously to the orientational signals emanating from either side of spatial domains about a region of said image for generating a feedback signal to said node means when the orientated signals from both sides of said spatial domains are of sufficient value and orientation to indicate that a boundary contour is present in the region of the image between said domains.

4,803,737

OPTICAL DIGITIZER

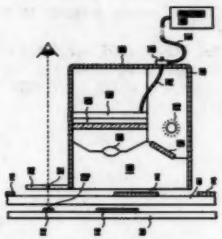
Yoichi Sato, and Kazuo Ichinokawa, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 762,144, Aug. 2, 1985, abandoned. This application Sep. 30, 1987, Ser. No. 104,525

Claims priority, application Japan, Aug. 7, 1984, 59-165310

Int. Cl.[4] G06K 9/82, 9/22

U.S. Cl. 382—65 **20 Claims**



1. An optical digitizer comprising a light active surface located above a graphic data recording medium and optical recognition means movable over said light active surface, said optical digitizer executing a processing for determining position coordinates and a rotational angle of said optical recognition means;

said light active surface comprising a light emitting media arranged to define a coordinate correlative pattern in the form of a lattice consisting of a plurality of longitudinal and lateral straight lines which intersect each other and have respectively coded spacings set at a multiple of an integer of unit length, binary digits (ones and zeros) being assigned to respective coordinate locations corresponding to the multiple of said integer of unit length in the longitudinal and lateral directions of said lattice pattern depending upon whether or not said longitudinal and lateral lines exist at said respective coordinate locations, said binary digits expressing said respective coordinate locations by means of a code sequence defining a maximum period sequence which is created by N stages of a circulating shift register and which is defined by a repetition of a bit pattern having a bit length of (2^N-1) in order to create (2^N-1) kinds of successive N-bit codes which are different from each other;

said optical recognition means comprising:

first means associated with said optical recognition means for visually tracing a data location on said recording medium in accordance with a movement of said optical recognition means to effect a positioning of said optical recognition means with respect to said data location; and

second means within said optical recognition means for sensing light emitted from a partial pattern which falls within a predetermined limited visual range of said coordinate correlative pattern to produce a corresponding electric signal, said emitted light having a wavelength which is different from the wavelength of light irradiated by said second means, said corresponding electrical signal effecting a computation for determining position coordinates of the graphic data on said recording medium, said computation being carried out by finding data which is indicative of an arbitrary single straight line from said projected image data corresponding to said partial pattern which is optically recognized by said second means to calculate said rotational angle with respect to said longitudinal or lateral lines within said visual range by using said data which is indicative of said arbitrary single straight line, calculating respec-

tive spacings between a plurality of longitudinal and lateral lines within said visual range to determine a corresponding successive N bit code from said respective spacings in order to identify a section to which said center of said visual range belongs, thus to calculate position coordinates of said center of said visual range.

4,803,738

RADIO COMMUNICATIONS SYSTEM WITH REDUCED D/U RATIO VARIATIONS

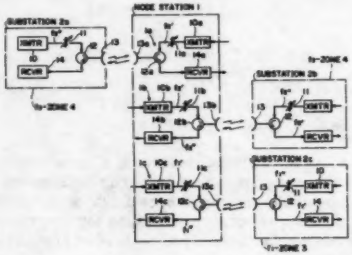
Kiyoshi Ikeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,227

Claims priority, application Japan, Feb. 10, 1986, 61-25981

Int. Cl.[4] H04B *1/60, 7/02*

U.S. Cl. 455—10 **1 Claim**



1. A radio communications system for covering an area which is divided into "k" concentric zones each being assigned a pair of particular frequencies or polarizations, comprising:

a node station located at the center of said area and having a plurality of node station transceivers; and

a plurality of substations located in said concentric zones at distance 1 from said node station and at distance 1_k from a boundary between (k-1)th and k-th zones and having a plurality of substation transceivers corresponding respectively to said node station transceivers to establish a plurality of pairs of two-way radio links therebetween,

each of said node and substations having a fine-weather reception field strength at each of said radio links, the fine-weather reception field strength at each end of longer distance radio links being greater than the fine-weather reception field strength at each end of shorter distance radio links, there being a linear relationship between said fine-weather reception field strength at each of said radio links and the distance of each link, wherein said linear relationship is given by:

$$RL = RL_k - \frac{(ML_k - ML_{(k-1)})}{2} \times \frac{l_k - 1}{l_k - l_{(k-1)}}$$

where,

RL=fine-weather reception field strength of each of said links at distance 1;

RL_k=fine-weather reception field strength of each of said links at distance l_k;

ML_k=difference between the fine-weather reception field strength of each of said links at distance l_k and tolerable rainfall reception field strength thereat; and

$ML_{(k-l)}$=difference between the fine-weather reception field strength of each of said links at distance $l_{(k-l)}$ and tolerable rainfall reception field strength thereat.

4,803,739

SSB COMMUNICATION SYSTEM

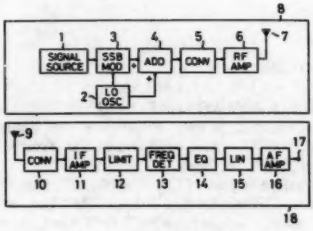
Kazuhiro Daikoku, and Shigeaki Ogose, both of Tokyo, Japan, assignors to Nippon Telegraph and Telegraph Corporation, Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,991

Claims priority, application Japan, Dec. 10, 1984, 59-259354; Jan. 28, 1985, 60-12618; Feb. 12, 1985, 60-23646; Apr. 19, 1985, 60-82530; Apr. 19, 1985, 60-82531; May 23, 1985, 60-109438; May 31, 1985, 60-116528; Jun. 21, 1985, 60-134213; Jun. 24, 1985, 60-136095; Oct. 24, 1985, 60-236449

Int. Cl.[4] H04B *1/68;* H03C *1/52*

U.S. Cl. 455—47 **9 Claims**



1. An SSB communication system comprising:

a transmitter transmitting an SSB amplitude modulation signal composed of both a single sideband carrier suppressed signal and a carrier signal; and

a receiver including

(a) an amplitude limiter which removes amplitude variations of received SSB amplitude modulation signal,

(b) a frequency detector connected to an output of said amplitude limiter to demodulate the SSB amplitude modulation signal,

(c) an equalizer, which is composed of an integrator, connected to an output of said frequency detector to compensate a frequency response of a frequency-detected signal, and

(d) a linearizer connected to an output of said equalizer to cancel out distortions contained in the demodulated signal, said linearizer comprises a Hilbert transformer providing a Hilbert transform of an input signal from said frequency detector, a multiplier providing a product of said Hilbert transformer output and the input signal, and a subtractor subtracting a second order product, derived from said multiplier, from the input signal.

DESIGN PATENTS

GRANTED FEB. 7, 1989

ERRATA

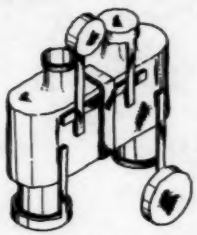
For CLASS	See PATENT NO.
D14-116	299,703

DESIGNS

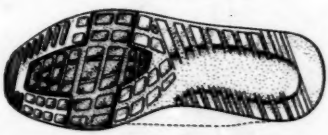
FEBRUARY 7, 1989

299,680
APRON
Daniel L. Ochsner, 2888 Bluff St., Boulder, Colo. 80302
Filed Oct. 20, 1986, Ser. No. 920,878
Term of patent 14 years
U.S. Cl. D2—228

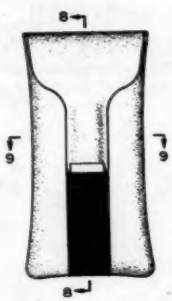
299,682
BINOCULAR PROTECTIVE COVER
Ray L. Winstead, R.D. #1, Box 263, Penn Run, Pa. 15765
Filed Dec. 27, 1985, Ser. No. 814,038
Term of patent 14 years
U.S. Cl. D3—33



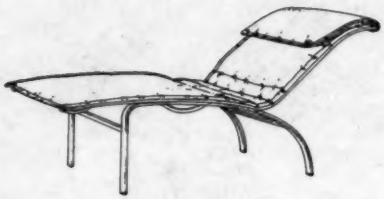
299,681
SHOE SOLE
David E. Miller, Carver, and Juan A. Diaz, Weymouth, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Jul. 20, 1988, Ser. No. 221,775
Term of patent 14 years
U.S. Cl. D2—320



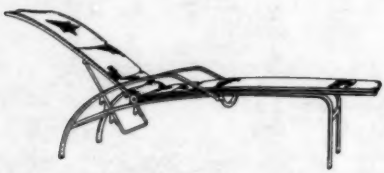
299,683
END FLAP SPECTACLE CASE
Robert J. Marks, Las Vegas, Nev., assignor to California Optical Leather, Inc., San Leandro, Calif.
Filed Oct. 28, 1985, Ser. No. 791,993
Term of patent 14 years
U.S. Cl. D3—34



299,684
CHAISE
Richard Frinier, Long Beach, Calif., assignor to Brown Jordan Company Limited Partnership, El Monte, Calif.
Filed Sep. 16, 1986, Ser. No. 908,100
Term of patent 14 years
U.S. Cl. D6—361

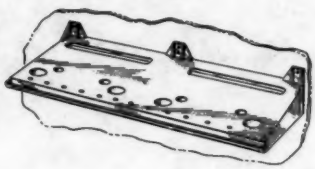


299,685
ADJUSTABLE CHAISE
Richard Frinier, Long Beach, Calif., assignor to Brown Jordan Company Limited Partnership, El Monte, Calif.
Filed Sep. 16, 1986, Ser. No. 908,103
Term of patent 14 years
U.S. Cl. D6—361



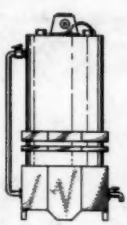
299,686
DISPENSER FOR NON-STERILE SURGICAL GLOVES
Ron. J. Jonas, 1320 North St., #30, Santa Rosa, Calif. 95404, and Linnette Birdsall, 417 Poppyhill Dr., Healdsburg, Calif. 95448
Filed Dec. 22, 1987, Ser. No. 136,390
Term of patent 14 years
U.S. Cl. D6—515

299,687
SHELF
Milton E. Handler, Northbrook, and Michael Peterson, Evanston, both of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Feb. 19, 1987, Ser. No. 16,238
Term of patent 14 years
U.S. Cl. D6—574

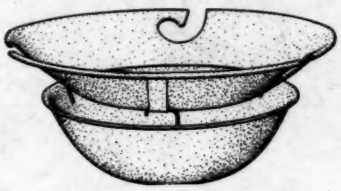


299,688
BEVERAGE MUG OR SIMILAR ARTICLE
Saiwha Chung, 3-1 Samchundong, JongroKu, Seoul, Rep. of Korea
Filed Apr. 25, 1986, Ser. No. 857,470
Claims priority, application Rep. of Korea, Nov. 1, 1985, 1985-15431
Term of patent 14 years
U.S. Cl. D7—9

299,689
MICROWAVE WATER DISPENSER
Paul T. Laycock, Box 42, Elton, Wis. 54430
Filed Jun. 16, 1986, Ser. No. 875,397
Term of patent 14 years
U.S. Cl. D7—313



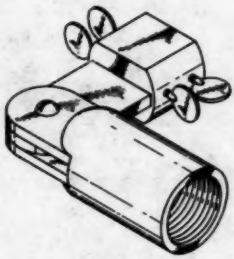
299,690
BARBEQUE GRILL ASH COLLECTOR
J. Jay Schnack, 32 Las Vegas Rd., Orinda, Calif. 94563, and Mark D. Wilson, 2745 Acacia Rd., Walnut Creek, Calif. 94595
Filed Jan. 27, 1987, Ser. No. 7,251
Term of patent 14 years
U.S. Cl. D7—402



299,691
PANEL CARRIER
Joseph M. Green, 3795 Vancouver, Dallas, Tex. 75229
Filed Aug. 26, 1985, Ser. No. 769,402
Term of patent 14 years
U.S. Cl. D8—14

299,692
WIRE STRIPPER OR THE LIKE
Richard A. Steiner, East Haddam, Conn., assignor to Rostra Tool Company, Branford, Conn.
Filed Nov. 17, 1987, Ser. No. 121,734
Term of patent 14 years
U.S. Cl. D8—98

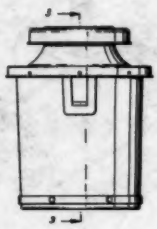
299,693
COUPLING FOR A PAINTBRUSH AND EXTENSION POLE
David H. Wick, Rte. 3, Box 269, Covington, Ky. 41017
Filed May 30, 1986, Ser. No. 875,359
Term of patent 14 years
U.S. Cl. D8—396



299,694
PERFUME FLASK
Reinold Geiger, Neuilly, France, assignor to Ateliers de Mountage Specialise Packaging, France
Filed Sep. 16, 1985, Ser. No. 776,289
Claims priority, application France, Mar. 14, 1985, 851 175
Term of patent 14 years
U.S. Cl. D9—300

299,695
DECANTER
Jacques Hine, Jarnac, France, assignor to Cognac Hine S.A., Jarnac, France
Filed Feb. 6, 1986, Ser. No. 826,728
Term of patent 14 years
U.S. Cl. D9—318

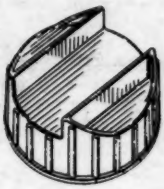
299,696
COMBINED PACKAGING CONTAINER AND LID THEREFOR
Paul C. Dallas, Fareham, United Kingdom, assignor to Sweetheart International Limited, Hampshire, England
Filed Sep. 5, 1985, Ser. No. 772,718
Claims priority, application United Kingdom, Mar. 8, 1985, 1025 456
Term of patent 14 years
U.S. Cl. D9—352



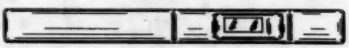
299,697
BOTTLE
Carl E. Frahm, 1428 Oak Meadow Rd., and B. Joseph Rokus, 1420 Oak Meadow Rd., both of Arcadia, Calif. 91006
Filed Aug. 29, 1985, Ser. No. 770,778
Term of patent 14 years
U.S. Cl. D9—386

299,698
CAN OR THE LIKE
Alfred C. DeBose, Jr., 11518 Stone Bridge, Houston, Tex. 77064
Filed Aug. 7, 1985, Ser. No. 763,419
Term of patent 14 years
U.S. Cl. D9—399

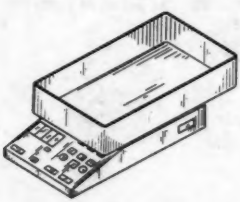
299,699
CAP FOR CONTAINERS
Sören M. Ask, Sigtuna, Sweden, assignor to Pharmacia AB, Upsala, Sweden
Filed Mar. 15, 1985, Ser. No. 712,150
Claims priority, application Sweden, Sep. 20, 1984, 84-2499
Term of patent 14 years
U.S. Cl. D9—453



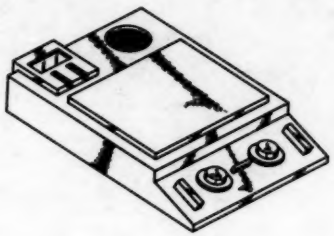
299,700
ELECTRONIC THERMOMETER
Takahisa Yubisui; Hiroshi Sakaguchi, and Masaki Kawamura, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 24, 1986, Ser. No. 911,622
Claims priority, application Japan, Mar. 24, 1986, 61-11040
Term of patent 14 years
U.S. Cl. D10—57



299,701
POCKET SIZE DIGITAL SCALE
Hannah S. Brewer, and David K. Brewer, both of 3720 Cheyenne Blvd., Sioux City, Iowa 51104
Filed May 19, 1986, Ser. No. 864,895
Term of patent 14 years
U.S. Cl. D10—91

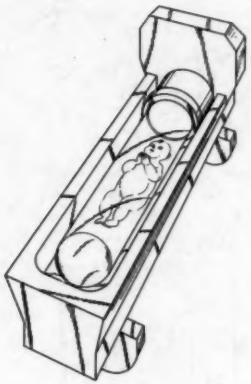


299,702
WEIGHT ALARM DIGITAL SCALE
Richard L. Heim, 4922A Murdoch St., St. Louis, Mo. 63109
Filed Jun. 19, 1986, Ser. No. 876,346
Term of patent 14 years
U.S. Cl. D10—91

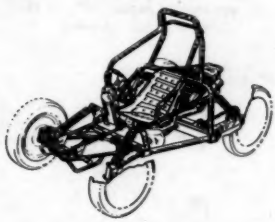


299,703
COMBINED BELL AND LAMP
Tatsuya Arai, Kitamoto, Japan, assignor to Kobishi Electric Co., Ltd., Japan
Filed Sep. 6, 1985, Ser. No. 773,822
Claims priority, application Japan, Aug. 30, 1985, 60-36767
The portion of the term of this patent subsequent to Jan. 12, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—116

299,704
NOVELTY FIGURINE
Charles W. Culpepper, 11035 Cedar Bend Ave., Baton Rouge, La. 70814
Filed Aug. 19, 1985, Ser. No. 766,579
Term of patent 14 years
U.S. Cl. D11—160



299,705
MOTOR VEHICLE BODY
Carlo Carpanelli, and Stefano Serenari, both of Bologna, Italy, assignors to GO PRO S.r.l., Bologna, Italy
Filed Aug. 27, 1985, Ser. No. 769,948
Term of patent 14 years
U.S. Cl. D12—88



299,706

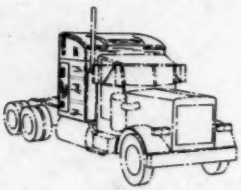
STAND UP SLEEPER BOX FOR A TRUCK

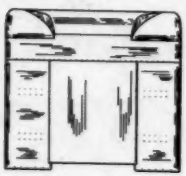
Randal P. Whitmer, Fremont, and Jeffrey Paul, Union City, both of Calif., assignors to Paccar Inc., Bellevue, Wash.

Filed May 30, 1986, Ser. No. 869,024

Term of patent 14 years

U.S. Cl. D12—96





299,707

FOUR-WHEELED MOTORCYCLE

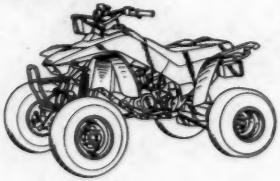
Akio Makita, Saitama; Tooru Nishino, Tokyo; Tetsuya Nakazawa, Saitama, and Kazutaka Kimura, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1986, Ser. No. 821,571

Claims priority, application Japan, Jul. 22, 1985, 60-31308

Term of patent 14 years

U.S. Cl. D12—107



299,708

MOTORCYCLE

Shinichi Yamase, Saitama; Hiroaki Tsujui, and Yoshihiko Aoyama, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1986, Ser. No. 822,023

Claims priority, application Japan, Jul. 25, 1985, 60-31879

Term of patent 14 years

U.S. Cl. D12—110

299,709

MOTORCYCLE

Takeo Miura, and Kiyoshi Takagi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 927,302

Term of patent 14 years

U.S. Cl. D12—110

299,710

MOTORCYCLE

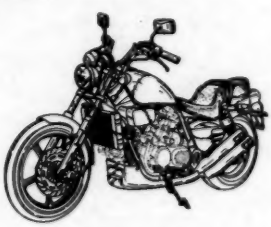
Masato Iwakura, Saitama; Kooichi Nakayama, Tokyo, and Eiji Ozawa, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,577

Claims priority, application Japan, Jun. 25, 1986, 61-24679

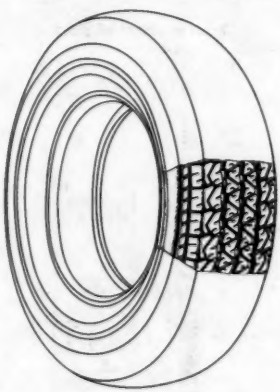
Term of patent 14 years

U.S. Cl. D12—110

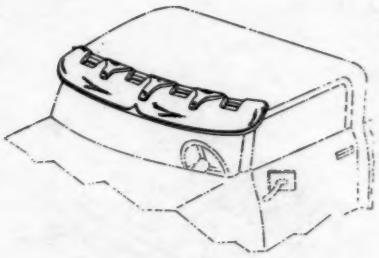


299,711
TIRE
Bill J. Wallet, Marshallville, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jun. 12, 1986, Ser. No. 873,638
Term of patent 14 years
U.S. Cl. D12—147

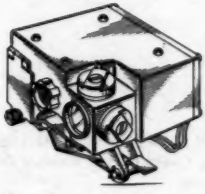
299,712
TIRE
Douglas J. Slagh, Greer, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Jul. 9, 1986, Ser. No. 883,908
Term of patent 14 years
U.S. Cl. D12—147



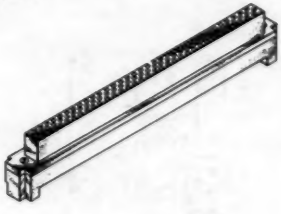
299,713
VEHICLE SUNVISOR
Leslie N. Dunham, 234 Division St., Boonton, N.J. 07005
Filed Dec. 15, 1986, Ser. No. 941,940
Term of patent 14 years
U.S. Cl. D12—191



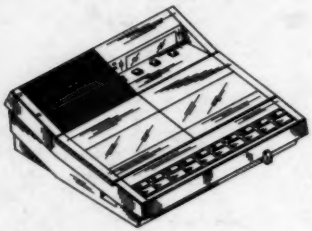
299,714
LASER OPERATED REPEATING SMALL ARMS TRANSMITTER
Daniel R. Colker; Lawrence J. Gallagher, both of Arcadia, and Antonio R. Vega, Pasadena, all of Calif., assignors to Loral Electro Optical Systems, Pasadena, Calif.
Filed Oct. 31, 1985, Ser. No. 793,672
Term of patent 14 years
U.S. Cl. D13—19



299,715
HIGH DENSITY RECEIVER MODULE
Jeffery P. Stowers, Mt. Sidney, and Henri T. Burgers, Grottoes, both of Va., assignors to Virginia Panel Corporation, Waynesboro, Va.
Filed Dec. 4, 1985, Ser. No. 804,584
Term of patent 14 years
U.S. Cl. D13—24



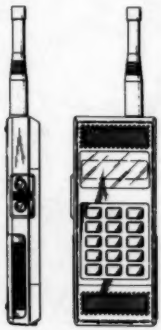
299,716
TELEPHONE ANSWERING MACHINE
Sandor F. Weisz, Stamford, Conn., and Andrew J. Blance, Mamaroneck, N.Y., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Oct. 31, 1986, Ser. No. 925,868
Term of patent 14 years
U.S. Cl. D14—141



299,717
COMBINATION TELEPHONE AND ANSWERING SET
Satoshi Fukutome, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 17, 1987, Ser. No. 121,741
Claims priority, application Japan, May 26, 1987, 62-21011
Term of patent 14 years
U.S. Cl. D14—141

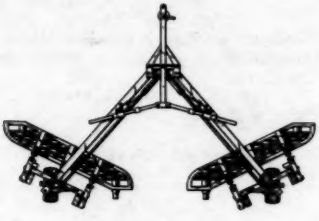
299,718
KEYPAD FOR TELECOMMUNICATIONS INSTRUMENTS
David J. Steer, Lincoln; Steven Hawker, Arnold, and Leonard Colebourne, Nottingham, all of England, assignors to Plessey Overseas Limited, Ilford, England
Filed Oct. 22, 1986, Ser. No. 922,987
Claims priority, application United Kingdom, Apr. 22, 1986, 1033654
Term of patent 14 years
U.S. Cl. D14—247

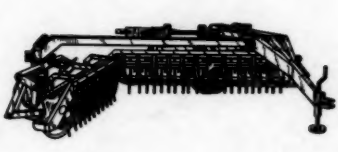
299,719
HANDSET RADIO TELEPHONE
Nils E. V. Martensson, Woking; Anthony B. Harrup, Weybridge; Mark Powell, Havant; Roger Wilkins, Southsea; Ron Major, Stroud, Chris M. Harrison, Frimley, Andrew Homan, Chessington and Francis Baldry, Haslemere, all of Great Britain, assignors to Technophone Limited of Ashwood House, Surrey, England
Filed Mar. 16, 1987, Ser. No. 25,933
Claims priority, application United Kingdom, Sep. 22, 1986, 1036854
Term of patent 14 years
U.S. Cl. D14—138



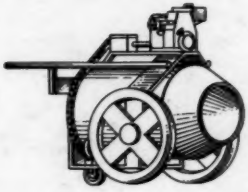
299,720
WATER PUMP
Byung K. Yoo, 266-3, Noahyon-Dong, Kangnam-ku, Seoul, Rep. of Korea
Filed Jun. 5, 1985, Ser. No. 741,612
Term of patent 14 years
U.S. Cl. D15—7

299,721
UNITIZED HAY RAKE
Emmett G. Webster, New Holland, Pa.; Douglas G. Branham, Canton, Mich.; Edmund O. Howell, and John K. Hale, both of New Holland, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.
Filed Sep. 24, 1986, Ser. No. 911,685
Term of patent 14 years
U.S. Cl. D15—11

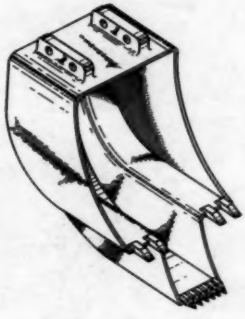




299,722
CEMENT MIXER
Fred E. Mehr, PO Box 1117, Hilo, Hi. 96721
Filed Oct. 7, 1985, Ser. No. 785,277
Term of patent 14 years
U.S. Cl. D15—19



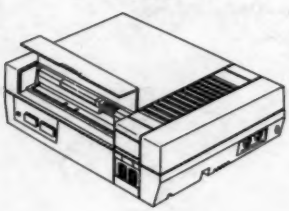
299,723
UTILITY TRENCH BUCKET
Lamont Frawley, 3215 Roosevelt Dr., Arlington, Tex. 76016
Filed Sep. 11, 1986, Ser. No. 906,186
Term of patent 14 years
U.S. Cl. D15—32



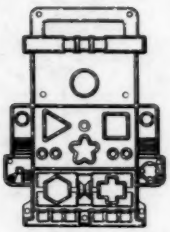
299,724
BINOCULARS
Akira Aoki, Tokyo, Japan, assignor to Seiwa Instruments Mfg. Co., Ltd., Saitama, Japan
Filed Sep. 9, 1985, Ser. No. 773,932
Claims priority, application Japan, Apr. 9, 1985, 60-14056
Term of patent 14 years
U.S. Cl. D16—133

299,725
VENDING MACHINE
John H. Brandes, Atlanta, and Paul A. Phillips, Marietta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Aug. 5, 1987, Ser. No. 93,514
Term of patent 14 years
U.S. Cl. D20—5

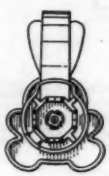
299,726
VIDEO GAME CONTROL UNIT
Masayuki Yukawa, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan
Filed Nov. 4, 1985, Ser. No. 803,871
Claims priority, application Japan, Aug. 1, 1985, 60-33210
Term of patent 14 years
U.S. Cl. D21—1



299,727
POUNDING ACTIVITY TOY
Ruth Elliott, Bramhall, United Kingdom, assignor to Hestair Kiddicraft Limited, Great Britain
Filed Apr. 22, 1986, Ser. No. 857,435
Claims priority, application United Kingdom, Nov. 4, 1985, 1030230
Term of patent 14 years
U.S. Cl. D21—59

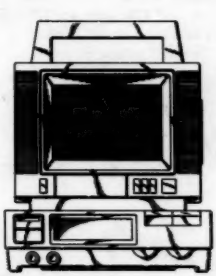


299,728
CRADLE RATTLE
Robert Kay, Stockport, and Peter A. Broadbent, Alderley Edge, both of United Kingdom, assignors to Hestair Kiddicraft Limited, Great Britain
Filed Apr. 29, 1986, Ser. No. 858,276
Claims priority, application United Kingdom, Nov. 4, 1985, 1030225
Term of patent 14 years
U.S. Cl. D21—64



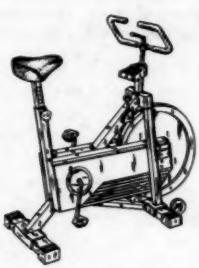
299,729
AUDIBLE TOY
Masaharu Takei, Nagano, Japan, and Edward Ferguson, Westminster, Calif., assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Aug. 26, 1986, Ser. No. 901,158
Term of patent 14 years
U.S. Cl. D21—64

299,730
TOY VCR DEVICE
Michael W. Nuttel, Carson, Calif., and Toshinori Tabata, Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 25, 1986, Ser. No. 857,788
Claims priority, application Japan, Oct. 25, 1985, 60-44878
Term of patent 14 years
U.S. Cl. D21—111



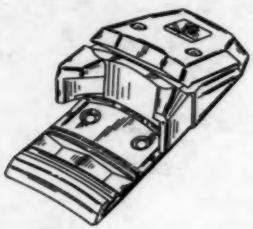
299,731
BUG FIGURE LOTTERY TICKET HOLDER
Jean A. Vetter, 10481 Salter Rd., North Rose, N.Y. 14516
Filed Sep. 5, 1985, Ser. No. 772,648
Term of patent 14 years
U.S. Cl. D21—185

299,732
BICYCLE EXERCISER
Tore L. Gustafsson, Varberg, Sweden, assignor to Monark AB, Sweden
Filed Jul. 29, 1986, Ser. No. 891,542
Claims priority, application Sweden, Jan. 29, 1986, 86-0213
Term of patent 14 years
U.S. Cl. D21—194



299,733
SKATEBOARD WHEEL OR SIMILAR ARTICLE
Nickolas G. Taminich, 10040 Karmont Ave., South Gate, Calif. 90280
Filed Sep. 3, 1987, Ser. No. 92,698
Term of patent 14 years
U.S. Cl. D21—226

299,734
TOEPIECE FOR SKI BINDING
Gerhard Sedlmair, Farchant, Fed. Rep. of Germany, assignor to Marker Deutschland GmbH, Garmisch-Partenkirchen, Fed. Rep. of Germany
Filed Jun. 20, 1985, Ser. No. 746,955
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 11AR4737/84
Term of patent 14 years
U.S. Cl. D21—230

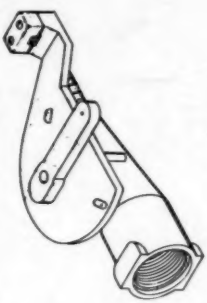


299,735
HANDLE FOR A FISHING ROD
James E. Andreasen, Magnolia Springs; Casey J. Childre; David B. Peed, both of Foley, all of Ala., and Wadre S. Shahid, Fort Walton Beach, Fla., assignors to Lew Childre & Sons, Inc., Foley, Ala.
Filed Feb. 20, 1986, Ser. No. 834,471
Term of patent 14 years
U.S. Cl. D22—142

299,736
HANDLE FOR A FISHING ROD
James E. Andreasen, Magnolia Springs; Casey J. Childre, and David B. Peed, both of Foley, all of Ala., assignors to Lew Childre & Sons, Inc., Foley, Ala.
Filed Feb. 20, 1986, Ser. No. 834,472
Term of patent 14 years
U.S. Cl. D22—142

299,737
HANDLE FOR A FISHING ROD
James E. Andreasen, Magnolia Springs, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.
Filed Feb. 20, 1986, Ser. No. 834,474
Term of patent 14 years
U.S. Cl. D22—142

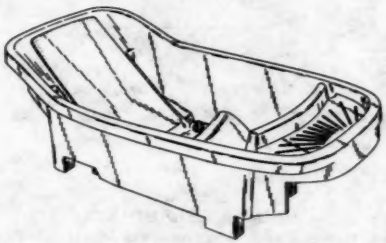
299,738
COMBINED VALVE AND CLAMPED CABLE OPERATOR
Glenn R. Huskey, Box 66, Elora, Tenn. 37328
Filed Jun. 29, 1987, Ser. No. 68,852
Term of patent 14 years
U.S. Cl. D23—245



299,739
LEVER HANDLE
Herbert V. Kohler, Jr., Kohler, Wis., and Paul P. Kolada, Bexley, Ohio, assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 819,878, Jan. 16, 1986, Pat. No. Des. 297,257. This application Apr. 18, 1988, Ser. No. 183,030
Term of patent 14 years
U.S. Cl. D23—252

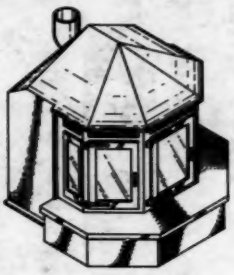
299,740
FAUCET KNOB
Herbert Reinecke, Iserlohn-Sümmern, Fed. Rep. of Germany, assignor to Aloys F. Dornbracht GmbH & Co., Iserlohn, Fed. Rep. of Germany
Filed Oct. 18, 1985, Ser. No. 789,057
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1985, MR 7435
The portion of the term of this patent subsequent to Jun. 30, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—254

299,741
INFANT BATH TUB
Paul Thom, Woburn, Mass., assignor to Kiddie Products, Inc., Avon, Mass.
Filed Aug. 19, 1986, Ser. No. 898,027
Term of patent 14 years
U.S. Cl. D23—278



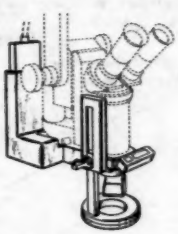
299,742
SHOWER ENCLOSURE
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 12, 1987, Ser. No. 2,257
Term of patent 14 years
U.S. Cl. D23—283

299,743
FIREPLACE
Rodney E. Criqui, 275 Moss Creek Dr., Hilton Head, S.C. 29928
Filed Jun. 19, 1986, Ser. No. 876,345
Term of patent 14 years
U.S. Cl. D23—344



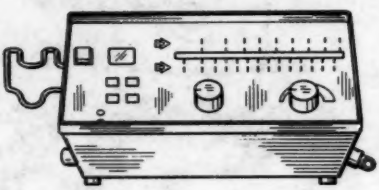
299,744
IMMUNOASSAY TEST KIT OR THE LIKE
Robert J. Bauer, Chicago, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jan. 9, 1986, Ser. No. 817,325
Term of patent 14 years
U.S. Cl. D24—17

299,745
KERATOMETER
Hiroaki Sasaki, Yokohama, and Yukitsugu Nakamura, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 8, 1986, Ser. No. 850,904
Term of patent 14 years
U.S. Cl. D24—17



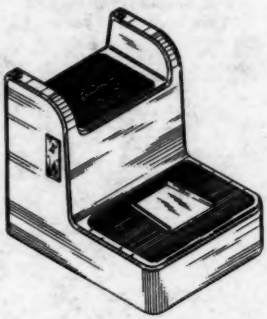
299,746
INSTRUMENT FOR MEASURING NERVE CONDUCTION VELOCITIES
Jack Guldalian, Jr., Lawrenceville, N.J., assignor to Neurotron, Inc., Lawrenceville, N.J.
Filed Aug. 21, 1986, Ser. No. 856,134
Term of patent 14 years
U.S. Cl. D24—17

299,747
ELECTROTHERAPY TREATMENT CABINET
John H. Wilson; Kenneth W. Coffey, both of Tulsa; Toby E. Smith, Broken Arrow; David Richards, Choteau; Maqsood Mohd, Tulsa, and Lee Cody, Inola, all of Okla., assignors to Rich-Mar Corporation, Tulsa, Okla.
Filed Dec. 8, 1986, Ser. No. 939,467
Term of patent 14 years
U.S. Cl. D24—40



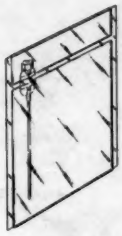
299,748
ELECTRONIC ACUPUNCTURE UNIT
David E. Robertson, Belair, Australia, assignor to Acuhealth Pty. Ltd., Wayville, Australia
Filed Nov. 13, 1986, Ser. No. 930,858
Claims priority, application Australia, May 13, 1986, 5194/86
Term of patent 14 years
U.S. Cl. D24—41

299,749
FOOT MASSAGER
Nancy C. Duncan, 1096 Farroll, Arroyo Grande, Calif. 93420, and Louis O. Schorsch, Grover City, Calif., assignors to Nancy C. Duncan, Arroyo Grande, Calif.
Filed May 5, 1986, Ser. No. 859,758
Term of patent 14 years
U.S. Cl. D24—42



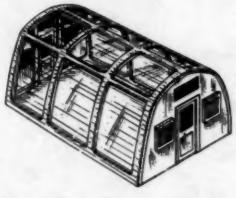
299,750
INFANT BOTTLE HOLDER
Jorce L. Garcia, 2318 S. Avers Ave., and Jose H. Garcia, 3924 W. 24th St., both of Chicago, Ill. 60623
Filed Jul. 10, 1986, Ser. No. 884,263
Term of patent 14 years
U.S. Cl. D24—48

299,751
REAGENT SOLUTION RESERVOIR
Paul K. Hsei, Huntington Beach, Calif., assignor to Smithkline Diagnostics, Sunnyvale, Calif.
Filed Apr. 14, 1986, Ser. No. 851,696
Term of patent 14 years
U.S. Cl. D24—58

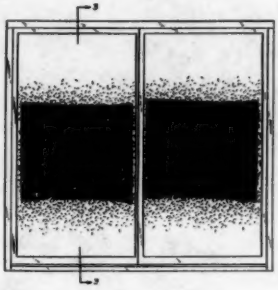


299,752
BUILDING
Michael J. Anania, Jr., and Donna J. Anania, both of 1407 Lewis, Des Moines, Iowa 50315
Filed Jan. 31, 1986, Ser. No. 824,670
Term of patent 14 years
U.S. Cl. D25—8

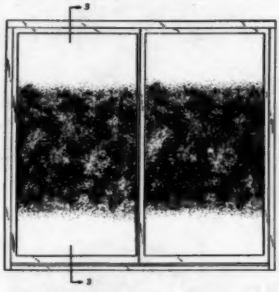
299,753
GREENHOUSE
Del P. Virgilio, 53 Greenings Ave., Pittsfield, Mass. 01201
Filed Sep. 17, 1986, Ser. No. 908,510
Term of patent 14 years
U.S. Cl. D25—15



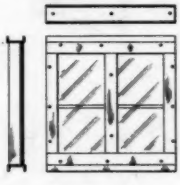
299,754
DECORATIVE SLIDING DOOR
Roger M. VanWeelden, Chicago, Ill., assignor to USG Corporation, Chicago, Ill.
Filed Jun. 7, 1985, Ser. No. 732,663
Term of patent 14 years
U.S. Cl. D25—48



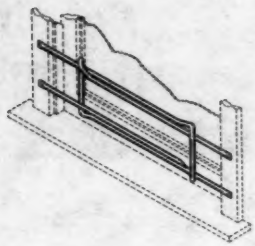
299,755
DECORATIVE SLIDING DOOR
Lawrence R. Martinelli, Wheeling, Ill., assignor to USG Corporation, Chicago, Ill.
Filed May 10, 1985, Ser. No. 732,667
Term of patent 14 years
U.S. Cl. D25—48



299,756
INDUSTRIAL WINDOW
Jose Alestra, 9251 Billy Mitchell Blvd., Roseville, Calif. 95678
Filed May 27, 1986, Ser. No. 867,392
Term of patent 14 years
U.S. Cl. D25—52

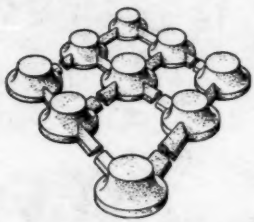


299,757
BURGLAR BAR
Richard G. Kluge, Pell Lake, Wis., assignor to John Sterling Corporation, Richmond, Ill.
Filed Jan. 19, 1988, Ser. No. 144,939
Term of patent 14 years
U.S. Cl. D25—53

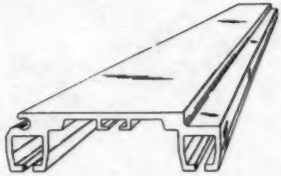


299,758
TILE INSERT FOR A WALL
James O. Kelley, Spring Lake, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Mar. 21, 1986, Ser. No. 845,422
Term of patent 14 years
U.S. Cl. D25—58

299,759
INTERSPACED EROSION PREVENTION STRUCTURE
Lok M. Sharma, 9227-187 St., Edmonton, Canada, T5T1R8
Filed Jul. 17, 1985, Ser. No. 755,883
Claims priority, application Canada, Dec. 19, 1984, 19-12-84-14
Term of patent 14 years
U.S. Cl. D25—117

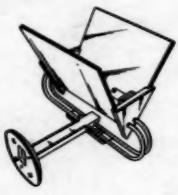


299,760
RAIL GUIDE FOR PLIABLE PLASTIC PREHUNG DOORS
Hans R. Higg, Enköping, Sweden, assignor to Stiftelsen Westmannaprodukter, Västerås, Sweden
Filed Feb. 12, 1986, Ser. No. 828,675
Term of patent 14 years
U.S. Cl. D25—119



299,761
LANTERN HEAD
Ming K. Chan, 1st Floor, 59 Hung To Road, Kowloon, Hong Kong
Filed Oct. 18, 1985, Ser. No. 789,190
Claims priority, application United Kingdom, May 1, 1985, 1026527
Term of patent 14 years
U.S. Cl. D26—40

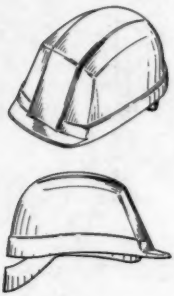
299,762
WALL LAMP
Perry King, and Santiago Miranda, both of Milan, Italy, assignors to Flos S.p.A., Italy
Filed Mar. 17, 1986, Ser. No. 845,011
Claims priority, application Italy, Sep. 19, 1985, 7103-B/85
Term of patent 14 years
U.S. Cl. D26—87



299,763
TABLE LAMP
Perry King, and Santiago Miranda, both of Milan, Italy, assignors to Flos S.P.A, Brescia, Italy
Filed Mar. 17, 1986, Ser. No. 845,048
Term of patent 14 years
U.S. Cl. D26—93

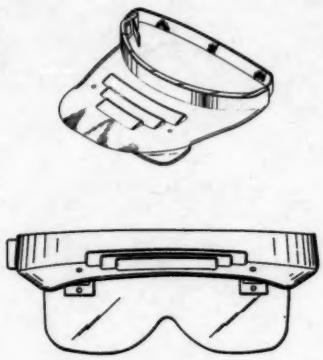
299,764
CONVERTIBLE CURLING IRON/STYLING BRUSH
Robert Oberheim, Liederbach, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Mar. 16, 1987, Ser. No. 26,097
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1986, 73 MR 9509
Term of patent 14 years
U.S. Cl. D28—35

299,765
HELMET OR SIMILAR ARTICLE
Stephen B. Lewis, St. Annes on Sea; Cyril Smith, Naphill, and John R. Feeney, Baguley, all of England, assignors to Protector Safety Industries Limited, Australia
Filed Aug. 30, 1985, Ser. No. 770,914
Claims priority, application United Kingdom, Aug. 14, 1985, 1025330
Term of patent 14 years
U.S. Cl. D29—14

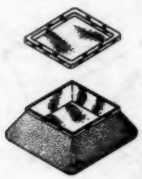


299,766
RIDING HAT HARNESS
Ronald S. Friedson, 95 Bayberry La., Westport, Conn. 06880
Filed Sep. 18, 1986, Ser. No. 909,096
Term of patent 14 years
U.S. Cl. D29—16

299,767
COMBINED SUN VISOR AND EYE SHIELD
Hsi-Wei Hsin, No. 80, Nei Keng Ts'un, Ta Liau Hsiang, Kao Hsiung, Taiwan
Filed Jun. 2, 1986, Ser. No. 869,934
Term of patent 14 years
U.S. Cl. D29—18



299,768
COMBINED PET FOOD DISH AND COVER
Patricia T. Windom, 6535 Langdon Ave., Van Nuys, Calif. 91406
Filed Jul. 28, 1987, Ser. No. 78,541
Term of patent 14 years
U.S. Cl. D30—129

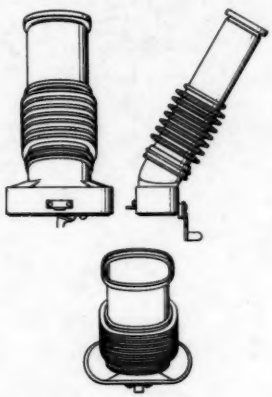


299,769
PET BED
Betty James, San Clemente, Calif., assignor to Flexi-Mat Corporation, Chicago, Ill.
Filed Apr. 25, 1988, Ser. No. 185,924
Term of patent 14 years
U.S. Cl. D30—119

299,770
BIRD FEEDER
Jerry W. Coffer, 3207 S.E. 36th, Portland, Oreg. 97202
Filed May 31, 1988, Ser. No. 201,098
Term of patent 14 years
U.S. Cl. D30—127

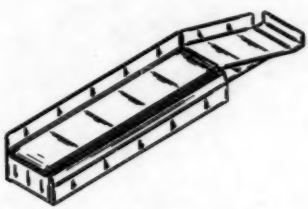
299,771
PET BOWL
John Kennedy, 26516 Del Mar Dr., Mission Viejo, Calif. 92691
Filed Nov. 9, 1987, Ser. No. 118,634
Term of patent 14 years
U.S. Cl. D30—130

299,772
VACUUM CLEANER HOSE COUPLING
Maurice E. Smith, P.O. Box 526, Camino, Calif. 95709
Filed Mar. 10, 1986, Ser. No. 842,422
Term of patent 14 years
U.S. Cl. D32—31

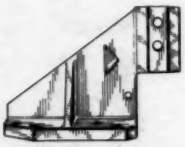


299,773
REFUSE AND STORAGE CONTAINER
Don Kracke, 39 Crespa Verde, Rolling Hills Estates, Calif. 90274
Filed Dec. 11, 1986, Ser. No. 940,256
Term of patent 14 years
U.S. Cl. D34—7

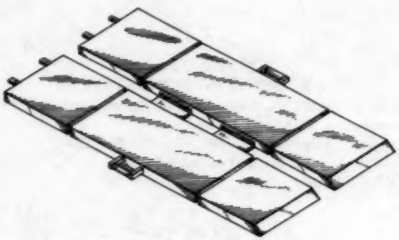
299,774
ENVELOPE CONVEYOR/STACKER
Edward A. Krupotich, Los Altos, Calif., assignor to Ovation Corporation, Mountain View, Calif.
Filed Sep. 5, 1986, Ser. No. 904,258
Term of patent 14 years
U.S. Cl. D34—29



299,775
LIFTING BED ACCESSORY FOR THE REPAIR OF VEHICLE BODIES
Germain Celette, Vienne, France, assignor to Celette S. A., Vienne, France
Filed Oct. 28, 1986, Ser. No. 924,167
Claims priority, application World Int. Prop. O., Apr. 28, 1986, GM/006843
Term of patent 14 years
U.S. Cl. D34—31



299,776
PORTABLE RAMP
Edward Canterberry, Rte. #4, Box 290, Winfield, Ala. 35594
Filed Oct. 14, 1986, Ser. No. 918,797
Term of patent 14 years
U.S. Cl. D34—32



299,777
CADDY FOR TRANSPORTING A PORTABLE PROPANE BOTTLE IN A HORIZONTAL MODE
Robert L. Michau, 927 Embercrest Dr., Arlington, Tex. 76017
Filed Jan. 13, 1986, Ser. No. 818,541
Term of patent 14 years
U.S. Cl. D34—38

299,778
TOOL CARRIER
M. Allyson Smith, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 1, 1985, Ser. No. 794,055
Term of patent 14 years
U.S. Cl. D34—40

299,779
CRUCIFIX
Chaim Kohen, Raanana, and Ephraim Rodensky, Petach, both of Israel, assignors to Jordan Trading Corporation, Miami, Fla.
Filed Jan. 21, 1986, Ser. No. 820,362
Term of patent 14 years
U.S. Cl. D99—27

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF FEBRUARY, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Munson, Harry R., Jr.; and Tankersley, Robert W., Jr., 4,803,200, Cl. 514-231.200.

AB Tetra Pak: *See*—
Larsen, Arild, 4,802,664, Cl. 271-201.000.

Abe, Takao: *See*—
Miyazawa, Akiyasu; Harada, Mineo; Tajima, Eiji; and Abe, Takao, 4,802,776, Cl. 400-124.000.

Abe, Yoshinori: *See*—
Hiratsuka, Seiichiro; Matsunawa, Masahiko; and Abe, Yoshinori, 4,803,558, Cl. 358-283.000.

Abe, Yukihiro: *See*—
Kanda, Nobuo; Abe, Yukihiro; and Kondo, Mitsuru, 4,803,193, Cl. 503-209.000.

Abiomed, Inc.: *See*—
Stricker, Saul, 4,802,650, Cl. 251-117.000.

Abiven, Jacques; and Audrain, Eric. Storage battery control device. 4,803,416, Cl. 320-44.000.

Ableitner, Erich, to Daimler-Benz Aktiengesellschaft. Cup tappet with hydraulic play compensation device. 4,802,448, Cl. 123-90.550.

Abo, Toshimi, to Nissan Motor Company Limited. Knocking control system and method for an internal combustion engine. 4,802,455, Cl. 123-425.000.

Abrahams, Sidney, to Genedyne Corp. Unipolar motor and mechanical conversion system and method. 4,803,391, Cl. 310-178.000.

Abromaitis, Andre T.; and Keyes, Marion A., IV, to Babcock & Wilcox Company, The. Carbon monoxide detector. 4,803,052, Cl. 422-91.000.

Achim, Storz: *See*—
Remigio, Ros; and Achim, Storz, 4,803,379, Cl. 307-112.000.

Ackermann, Norbert: *See*—
Knecht, Heinz; and Ackermann, Norbert, 4,802,561, Cl. 188-318.000.

Adachi, Hideki: *See*—
Tomosada, Masahiro; Ogawa, Hiroshi; Tohyama, Yoshikuni; Adachi, Hideki; Suzuki, Tadashi; and Ohki, Naoyuki, 4,803,520, Cl. 355-7.000.

Adamson, Thomas. Drill head. 4,802,798, Cl. 408-112.000.

Administrators of the Tulane Educational Fund, The: *See*—
Coy, David H.; and Hocart, Simon J., 4,803,261, Cl. 530-333.000.

Advanced Micro Devices, Inc.: *See*—
Bower, Robert W., 4,803,176, Cl. 437-33.000.
Chen, Shallop J.; and Johansson, Jan, 4,803,702, Cl. 375-106.000.

Advanced Nuclear Fuels Corporation: *See*—
Patterson, John F., 4,803,044, Cl. 376-444.000.

Advantage Engineering Incorporated: *See*—
Wash, Steven E., 4,802,338, Cl. 62-98.000.

Aerojet-General Corporation: *See*—
Mandl, William J., 4,803,661, Cl. 365-184.000.

Afros S.p.A.: *See*—
Fiorentini, Carlo, 4,802,770, Cl. 366-177.000.

Agreda, Victor H.: *See*—
Steinmetz, Guy R.; Rule, Mark; Agreda, Victor H.; and Treece, Lanney C., 4,803,296, Cl. 560-80.000.

Agri-Diagnostics Associates: *See*—
Petersen, Frank P.; Maybroda, Adrianna M.; and Miller, Sally A., 4,803,155, Cl. 435-7.000.

Aharon, Oren, to Blaser Industries, Incorporated. Laser printer recording system. 4,803,498, Cl. 346-108.000.

Ahlstrom, John K.: *See*—
Bernstein, David H.; Wallach, Walter A.; Richmond, Michael S.; Ahlstrom, John K.; Pilat, John F.; Farber, David A.; Belgard, Richard A.; and Bratt, Richard G., 4,803,619, Cl. 364-200.000.

Ahn, Kie Y.; Basavaiah, Saryadevara; Brodsky, Stephen B.; Cortellino, Charles A.; and Levine, Joseph E., to International Business Machines Corporation. Coated mask for photolithographic construction of electric circuits. 4,803,110, Cl. 428-137.000.

Aichi Steel Works, Limited: *See*—
Ooki, Takao; and Eguchi, Jun, 4,802,918, Cl. 75-10.610.

Aidlin Automation Corp.: *See*—
Aidlin, Stephen H.; and Bailey, Russell, 4,802,569, Cl. 198-346.100.

Aidlin, Stephen H.; and Bailey, Russell, to Aidlin Automation Corp. Two station robotic welder. 4,802,569, Cl. 198-346.100.

Aiki, Kunio; Sasayama, Atsuhi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, to Hitachi, Ltd.; and Hitachi Tobu Semiconductor, Ltd. Photoelectric device with optical fiber and laser emitting chip. 4,803,361, Cl. 250-227.000.

Air Products and Chemicals, Inc.: *See*—
Spector, Marshall, 4,802,905, Cl. 71-68.000.

Airhart, Tom P., to Atlantic Richfield Company. Three-component three-dimensional seismic data acquisition. 4,803,669, Cl. 367-72.000.

AirSep Corporation: *See*—
Vrana, Edward E.; and Bansal, Ravinder K., 4,802,899, Cl. 55-161.000.

Ajinomoto Co., Inc.: *See*—
Hijiya, Toyoto; Takemoto, Tadashi; and Yukawa, Toshihide, 4,803,300, Cl. 562-450.000.

Ajioka, Masanobu: *See*—
Itoh, Hiroyuki; Kono, Yoshitsugu; Ajioka, Masanobu; Takenaka, Shinji; and Kataita, Masafumi, 4,803,065, Cl. 423-502.000.

Akagi, Takao: *See*—
Koyama, Motoyasu; Teraoka, Hidetoshi; Akagi, Takao; Yamaguchi, Shinji; Sakamoto, Itsuki; Namba, Akira; and Okagaki, Isao, 4,803,332, Cl. 219-121.520.

Akai, Norio: *See*—
Doi, Hajime; Akai, Norio; and Matsumoto, Fujio, 4,803,584, Cl. 360-133.000.

Akasaka, Nobuhiro: *See*—
Fukuma, Masumi; and Akasaka, Nobuhiro, 4,802,732, Cl. 350-96.230.

Akashi, Akira; and Yamada, Masanori, to Canon Kabushiki Kaisha. Automatic focusing device. 4,803,507, Cl. 354-400.000.

Akebono Brake Industry Co., Ltd.: *See*—
Ogino, Kinji, 4,802,713, Cl. 303-119.000.

Akebono Research and Development Centre Ltd.: *See*—
Ogino, Kinji, 4,802,713, Cl. 303-119.000.

Akiba, Yosuke. Absorbent for a gas preservative atomosphere. 4,802,574, Cl. 206-204.000.

Akiba, Yutaka: *See*—
Nakao, Takeshi; and Akiba, Yutaka, 4,803,674, Cl. 369-13.000.

Akopov, Ernest M.; Schitinin, Valery E.; and Arapova, Anna V., to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki. Surgical instrument. 4,802,578, Cl. 206-339.000.

Aktiebolaget Hassle: *See*—
Falk, Karl-Erik L.; Hagonson, Sven M.; Rosinski, Adam; and Sjogren, John A., 4,803,081, Cl. 424-488.000.

ALC Co., Inc.: *See*—
Smith, Edward J., 4,802,313, Cl. 51-438.000.

Alcatel N.V.: *See*—
Dierckx, Rudolf F. I.; Sallaerts, Daniel; and Guebels, Pierre-Paul F., 4,803,648, Cl. 364-724.190.
Reusens, Peter P. F., 4,803,437, Cl. 328-59.000.

Alden, Wayne S., III: *See*—
Ierardi, Joseph A.; and Alden, Wayne S., III, 4,803,424, Cl. 324-158.00F.

Alexander, Lloyd E.: *See*—
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Alexandrovich, Peter S.: *See*—
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Alexion, Christopher C.: *See*—
Nathenson, Richard D.; Alexion, Christopher C.; and Sumpman, Wayne C., 4,802,531, Cl. 165-104.280.

Alfatechnic AG: *See*—
Dubach, Werner F., 4,802,597, Cl. 215-307.000.

Alford, Richard M., to Standard Oil Company (Indiana), now Amoco Corp. Multisource multireceiver method and system for geophysical exploration. 4,803,666, Cl. 367-36.000.

Alfred Karcher GmbH & Co.: *See*—
Dautel, Heinz; and Wesch, Johann G., 4,802,628, Cl. 239-227.000.

Alfred Teves GmbH: *See*—
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Algoma Steel Corporation, Limited, The: *See*—
McBain, Robert M.; Becze, Garry J.; Kruppert, Friedrich W.; and Leistner, Jack W., 4,803,037, Cl. 266-78.000.

Alibert, Vernon F. Cable connector arrangement to accommodate an angular cable layout. 4,802,865, Cl. 439-461.000.

Allaire, Jean-Luc, to U.S. Philips Corporation. Keyboard. 4,802,779, Cl. 400-496.000.

Allied-Signal Inc.: *See*—
Altman, Carl E.; and Rao, Mocherla K. K., 4,803,247, Cl. 525-179.000.
Fraenkel, Howard A.; Davenport, Karen A.; and Spicciati, Frank A., 4,803,097, Cl. 427-307.000.
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,802,268, Cl. 28-254.000.
Rabinkin, Anatol, 4,802,933, Cl. 148-403.000.

Allio, Roland; Chifflet, Raymond; and Jeantin, Phillipe, to Compagnie Generale D'Automatisme CGA-HBS. Conveyor device for flat objects. 4,802,665, Cl. 271-225.000.

Alnafissa, Fahad A. Insect trapping pet food dish. 4,802,302, Cl. 43-114.000.

Alphasem Corporation: *See*—
Kunz, Rene, 4,803,124, Cl. 428-200.000.
Alps Electric Co., Ltd.: *See*—
Kobayashi, Masato, 4,803,030, Cl. 264-278.000.
Obkita, Masao; and Ohmori, Shinichi, 4,803,576, Cl. 360-99.080.
Sutoh, Hiroki; and Sawada, Kenji, 4,803,317, Cl. 200-438.000.
Altman, Carl E.; and Rao, Mocherla K. K., to Allied-Signal Inc. Polyamide compositions having nitrile rubber and copolymer of ethylene and alpha-olefin therein. 4,803,247, Cl. 525-179.000.
Altner, David J. Weightlifter's belt. 4,802,667, Cl. 272-123.000.
Alumax, Inc.: *See*—
Waters, Herman H.; and White, John, 4,802,553, Cl. 182-222.000.
Aluminium Pechiney: *See*—
Hudault, Gerard; and Netter, Pierre, 4,802,656, Cl. 266-225.000.
Alvarez, Antonio R.; and Kirchgessner, James A., to Motorola Inc. Method of fabricating a bipolar semiconductor device with silicide contacts. 4,803,175, Cl. 437-31.000.
AM International, Inc.: *See*—
Witczak, Stanley, 4,802,411, Cl. 101-216.000.
Amada Company, Limited: *See*—
Hirata, Tadashi; Koyama, Katsumi; Takahashi, Hideaki; Harashima, Yasuhiro; Kitahara, Michio; Igarashi, Katsuyuki; Kitamura, Jun; Kikuchi, Hiroshi; and Narisada, Kimiyuki, 4,803,372, Cl. 250-561.000.
Ikeda, Hidekatsu; Miyama, Hidetoshi; and Kashiwabara, Yoshihiko, 4,802,567, Cl. 198-345.000.
Lee, Chun-Sheu; and Ream, Stanley L., 4,803,694, Cl. 372-98.000.
Amano, Jiro; Shimada, Masato; Takano, Kouzou; and Tohyama, Shunroku, to Toray Industries Incorporated. Waterproof fabric having high moisture permeability and method of making same. 4,803,116, Cl. 428-286.000.
Amaray International Ltd.: *See*—
Pijanowski, Stefan; Thompson, Peter; and Dartnall, Adrian, 4,802,601, Cl. 220-4.00R.
AMCA International Corp.: *See*—
Kelly, David L.; and Needham, Jeffrey R., 4,802,316, Cl. 52-90.000.
Amcon, Inc.: *See*—
Mason, Roy G.; and Andreasen, Leif, 4,803,427, Cl. 324-207.000.
Ameen, Joseph G.; Carden, Timothy F.; Cutting, Lawrence R.; Engle, Stephen R.; and Moore, Ronald J., to International Business Machines Corporation. Suspension and use thereof. 4,803,100, Cl. 427-387.000.
American Cyanamid Company: *See*—
Lee, Ving J.; and Curran, William V., 4,803,280, Cl. 548-127.000.
American Laser Corporation: *See*—
Chaffee, Edwin G., 4,803,697, Cl. 372-107.000.
American National Can Company: *See*—
Raniere, Jean E.; Smith, Steven L.; Gehrke, Russell P.; and Johnson, Richard E., Jr., 4,803,102, Cl. 428-35.200.
American Standard Inc.: *See*—
Fourie, Eugene; and Rumsey, Steven C., 4,802,559, Cl. 188-196.00A.
Rogers, Larry K., 4,802,402, Cl. 91-268.000.
American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Miller, Calvin M., 4,802,723, Cl. 350-96.150.
Thomson, David L., 4,803,730, Cl. 381-49.000.
American Telephone and Telegraph Co., AT&T Bell Labs: *See*—
Moyer, Harold W.; and Scholz, Harry R., 4,803,540, Cl. 357-70.000.
American Telephone and Telegraph Company, AT&T Technologies, Inc.: *See*—
Palmquist, John M.; and Saunders, Morton J., 4,802,726, Cl. 350-96.200.
AMI, Inc.: *See*—
Johnson, James R., 4,802,582, Cl. 206-390.000.
Ammann, Ernst; and Marhoff, Paul, to Siemens Aktiengesellschaft. X-ray diagnostics installation for radiographs. 4,803,716, Cl. 378-155.000.
Amoco Corporation: *See*—
Mehlberg, Robert L., 4,802,975, Cl. 208-390.000.
Werth, Dennis L.; and Reddy, Virupaksha K., 4,803,021, Cl. 264-25.000.
AMP Incorporated: *See*—
Palmer, James W., 4,802,867, Cl. 439-587.000.
Rypinski, Chandos A., 4,803,485, Cl. 340-825.050.
Amtel, Inc.: *See*—
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Anchor Hocking Corporation: *See*—
Ochs, Charles S.; and Koontz, Carl E., 4,803,031, Cl. 264-255.000.
Andersen, Niels H.: *See*—
Stanton, Thomas H.; Clagett, James A.; Schindele, Deborah C.; Renzoni, George E.; Andersen, Niels H.; and Opheim, Kent E., 4,803,170, Cl. 436-518.000.
Andersen, Timm. Magnetic socket and tool holder. 4,802,580, Cl. 206-378.000.
Anderson, Emmett L. Sporting apparatus support device for the handicapped. 4,802,612, Cl. 224-208.000.
Anderson, John M., to General Electric Company. Envelope for small high-intensity-discharge electrodeless arc lamp. 4,803,404, Cl. 313-634.000.
Anderson, Richard N., to Hunter Douglas Inc. Support for an operating element of a venetian blind assembly. 4,802,522, Cl. 160-168.100.
Anderson, Steven D.: *See*—
Hayes, Paul C., Jr.; and Anderson, Steven D., 4,802,986, Cl. 210-635.000.
Ando, Eiji: *See*—
Hibino, Junichi; and Ando, Eiji, 4,803,287, Cl. 549-252.000.
Ando, Makoto; and Kojima, Hiroshi, to Minolta Camera Kabushiki Kaisha. Intermediate optical device. 4,802,738, Cl. 350-257.000.
Andow, Fumio, to Kabushi Kaisha Toshiba. Information data output device for electric-power systems. 4,803,635, Cl. 364-483.000.
Andre, Wolfram K.: *See*—
Wolf, Kurt; and Andre, Wolfram K., 4,803,344, Cl. 219-497.000.
Andreasen, Leif: *See*—
Mason, Roy G.; and Andreasen, Leif, 4,803,427, Cl. 324-207.000.
Andreoli, Gian P., to ISEO Serrrature SPA. Double-throw bar lock having independently operable cylinders. 4,802,352, Cl. 70-118.000.
Andress, Harry J.; and Ashjian, Henry, to Mobil Oil Corporation. Reaction products of alkenylsuccinic compounds with aromatic amines and hindered alcohols and lubricant compositions thereof. 4,803,004, Cl. 252-51.50A.
Andus Corporation: *See*—
Kittler, Wilfred C., 4,802,967, Cl. 204-192.140.
Angehrn, Jorg A.: *See*—
Graebner, Peter; Sie, Swan A.; and Angehrn, Jorg A., 4,803,479, Cl. 340-860.000.
Anglin, Noah L., to Greyhawk Systems, Inc. Method of and apparatus for mounting a mirror to a rotatable shaft. 4,802,752, Cl. 350-631.000.
Anton, David L.; Korant, Bruce D.; and Wang, Chia-Lin J., to Du Pont de Nemours, E. I., and Company. S-modified adenosyl-1,8-diamino-3-thiooctane derivatives. 4,803,272, Cl. 544-277.000.
Antosch, Jerry J.: *See*—
Chohan, Satish M.; and Antosch, Jerry J., 4,802,696, Cl. 285-317.000.
Anzai, Shunju: *See*—
Asada, Atsushi; and Anzai, Shunju, 4,803,519, Cl. 355-8.000.
Aoki, Haruo; and Kudo, Yoshihiko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for treating liquid used for absorbing gaseous sulfur dioxide in the process for desulfurization of combustion exhaust gas. 4,802,966, Cl. 204-182.400.
Aplix, S.A.: *See*—
Billarant, Patrick J.; and Queval, Bruno, 4,802,939, Cl. 156-155.000.
Appelbaum, Edward R., to Lubrizol Genetics, Inc. Nif promoter of fast-growing rhizobium japonicum. 4,803,165, Cl. 435-172.300.
Appleton, Richard A.; Dixon, John; and Burford, Sidney C., to Fisons plc. Pyrazole-3-amines as anti-inflammatory agents. 4,803,216, Cl. 514-407.000.
Aprugese, John: *See*—
Cochran, Frederick; Davis, Jack; and Aprugese, John, 4,803,687, Cl. 372-5.000.
Arai, Yasuji: *See*—
Yasuike, Osamu; Arai, Yasuji; Ikemoto, Hiroyuki; Owa, Nobutaka; and Doi, Shunichi, 4,803,627, Cl. 364-424.050.
Arai, Yoji: *See*—
Yasuda, Makoto; Miyashita, Tsune; Murayama, Seiichi; Arai, Yoji; and Yamada, Fuzio, 4,803,406, Cl. 315-174.000.
Araki, Hiroaki: *See*—
Saito, Shinji; Araki, Hiroaki; Ejiri, Kiyomi; Ogawa, Hiroshi; and Mizuno, Chiaki, 4,803,131, Cl. 428-694.000.
Aramaki, Hitoshi: *See*—
Kishi, Hajimu; Matsui, Mitsuo; and Aramaki, Hitoshi, 4,803,633, Cl. 364-474.030.
Arapova, Anna V.: *See*—
Akopov, Ernest M.; Schitinin, Valery E.; and Arapova, Anna V., 4,802,578, Cl. 206-339.000.
Arasmith, Stanley. Winged cutting knife for producing wood chips or flakes. 4,802,631, Cl. 241-88.100.
Arata, Tetsuya: *See*—
Suefuji, Kazutaka; Kaneda, Aizo; Kanai, Yasuyuki; Nakamura, Shozo; Arata, Tetsuya; Kikuchi, Katsuaki; Senshu, Takao; Nakakado, Kimiaki; Maeda, Eiji; and Minakawa, Sadatsohi, 4,802,831, Cl. 418-55.000.
Araya, Hiroyuki: *See*—
Sumitani, Shigeto; Noguchi, Haruo; and Araya, Hiroyuki, 4,802,529, Cl. 165-29.000.
Ariyama, Hiroichi: *See*—
Kobayashi, Masakazu; Harashima, Konomi; and Ariyama, Hiroichi, 4,802,286, Cl. 34-15.000.
Armand, Michel; Fouletier, Mireille; and Degott, Pierre, to Societe Nationale Elf Aquitaine. Derivatives of polycarbone sulfides. 4,803,249, Cl. 525-326.200.
Armellin, Giancarlo, to Pirelli Coordinamento Pneumatici S.p.A. Motorcycle tires. 4,802,520, Cl. 152-454.000.
Armijo, Richard L.; and Coughlin, Paul R., to Armijo, Richard L.; and Coughlin, Paul R. Data diskette cartridge storage tray with resilient bumpers. 4,802,587, Cl. 206-444.000.
Armstrong Rubber Co., The: *See*—
Szyms, Walter, 4,802,937, Cl. 156-118.000.
Artzt, Peter: *See*—
Yngve, Paul W.; Artzt, Peter; Egbers, Gerhard; Stark, Ullrich; and Muller, Heinz, 4,802,330, Cl. 57-238.000.
Asada, Atsushi; and Anzai, Shunju, to Sharp Kabushiki Kaisha. Electrophotographic copying machine with document-winding drum and document table. 4,803,519, Cl. 355-8.000.
Asahi Corporation: *See*—
Kobayashi, Toshio, 4,802,668, Cl. 273-1.0GE.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Takeda, Kunihiko, 4,803,057, Cl. 423-6.000.
ASEA Aktiebolag: *See*—
Nordvall, Jan O., 4,802,368, Cl. 73-862.690.

Asea Brown Boveri AB: *See*—
Engdahl, Goran, 4,802,660, Cl. 267-182.000.
ASEA-Stal AB: *See*—
Brannstrom, Roine, 4,802,796, Cl. 406-141.000.
Asecom S.C.L.: *See*—
Britos, Jose D., 4,803,312, Cl. 178-17.00R.
Ashjian, Henry: *See*—
Andress, Harry J.; and Ashjian, Henry, 4,803,004, Cl. 252-51.50A.
Ashland Oil, Inc.: *See*—
Dammann, Laurence G., 4,803,245, Cl. 525-123.000.
Goel, Anil B., 4,803,257, Cl. 528-45.000.
Moy, Timothy Y.; and Radcliff, Jeffery W., 4,802,627, Cl. 239-112.000.
Ashley, Donald J., to International Business Machines Corporation. Power control and fault isolation indicator. 4,803,592, Cl. 361-79.000.
Aslanian, Jerry L. Flow control device for administration of intravenous fluids. 4,802,506, Cl. 137-556.000.
Asyst Technologies: *See*—
Bonora, Anthony C.; and O'Sullivan, Andrew W., 4,802,809, Cl. 414-217.000.
Ateya, Kamal, to Sandoz Ltd. Compositions comprising a water-soluble metal complex dye, an oxyalklated amine sulphate ester and a dispersing agent. 4,802,887, Cl. 8-524.000.
Atlantic Richfield Company: *See*—
Airhart, Tom P., 4,803,669, Cl. 367-72.000.
Siegfried, Robert W., II, 4,803,667, Cl. 367-69.000.
Atochem: *See*—
Pralus, Christian, 4,803,063, Cl. 423-588.000.
Atterby, Fred; Voss-Schrader, Bertil; and Tenggvist, Lennart. Pallet consisting of two or several base members. 4,802,421, Cl. 108-51.100.
Audrain, Eric: *See*—
Abiven, Jacques; and Audrain, Eric, 4,803,416, Cl. 320-44.000.
Augat Inc.: *See*—
Ierardi, Joseph A.; and Alden, Wayne S., III, 4,803,424, Cl. 324-158.00F.
Augustine, Frank L.: *See*—
Gaalema, Steve D.; and Augustine, Frank L., 4,803,363, Cl. 250-338.400.
Aulich, Hubert; Urbach, Hans-Peter; and Eisenrith, Karl-Heinz, to Siemens Aktiengesellschaft. Heterogeneous catalyst containing silicon dioxide. 4,803,188, Cl. 502-232.000.
Ausimont S.p.A.: *See*—
Brunetta, Fabio; Bader, Stefano; and Pantini, Giovanni, 4,803,067, Cl. 424-63.000.
Autoflug GmbH & Co. Fahrzeugtechnik: *See*—
Singer, Kalus P., 4,802,634, Cl. 242-107.40A.
Autopart Sweden AB: *See*—
Svensson, E. Gunnar, 4,803,602, Cl. 362-135.000.
Avco Corporation: *See*—
Decko, Gary W.; Peng, Yao; and Vogel, Herman, 4,802,823, Cl. 416-97.00A.
Avis, Richard J. A.: *See*—
Wilkinson, James H.; and Avis, Richard J. A., 4,803,567, Cl. 360-33.100.
Avnet, Inc.: *See*—
Burton, Larry W., 4,803,412, Cl. 318-567.000.
Azdel, Inc.: *See*—
Chilva, Timothy E., 4,802,843, Cl. 432-8.000.
B. F. Goodrich Company, The: *See*—
Kramer, James H., 4,802,430, Cl. 114-169.000.
B.H.F. (Engineering) Limited: *See*—
Stephens, Alan, 4,803,698, Cl. 373-27.000.
B. V. Optische Industrie "De Oude Delft": *See*—
Vlasbloem, Hugo, 4,803,714, Cl. 378-62.000.
Baas, Dieter, to Deutsche Thomson-Brandt GmbH. Circuitry for an audio or video disk player. 4,803,676, Cl. 369-143.000.
Baba, Takeshi; Suda, Shigeyuki; Nose, Noriyuki; Kawakami, Eigo; Nakajima, Toshiyuki; and Kushibiki, Nobuo, to Canon Kabushiki Kaisha. Variable-focus optical element and focus detecting device utilizing the same. 4,802,746, Cl. 350-418.000.
Babb, Bruce: *See*—
Sundberg, Michael W.; Babb, Bruce; and McClune, Gregory, 4,803,157, Cl. 435-21.000.
Babb, Bruce E.; Belly, Robert T.; and Mura, Albert J., to Eastman Kodak Company. Biological and analytical uses of phenalenone and benzphenalenone compounds. 4,803,161, Cl. 435-29.000.
Babcock, Michael: *See*—
Livingston, Mark L.; and Babcock, Michael, 4,802,344, Cl. 62-372.000.
Babcock & Wilcox Company, The: *See*—
Abromaitis, Andre T.; and Keyes, Marion A., IV, 4,803,052, Cl. 422-91.000.
Dickson, Edwin J., 4,802,425, Cl. 110-336.000.
Bach, Eric: *See*—
Durrer, Rudolph; Priessner, Hilmar; and Bach, Eric, 4,802,585, Cl. 206-449.000.
Bachleider, Walter F.; Frankel, Maurice; and Fiore, Peter, to Testing Machines Inc. Apparatus and process for impact testing of plastics. 4,802,366, Cl. 73-799.000.
Bachman, Wesley J.; and Stone, Steven G., to Dickey-john Corporation. Universal controller for material distribution device. 4,803,626, Cl. 364-424.070.
Bachmann, Peter K.; Geittner, Peter E. E.; Leers, Dieter; and Wilson, Howard J. C., to U.S. Philips Corp. Fluorine-doped optical fibre and method of manufacturing such fibre. 4,802,733, Cl. 350-96.340.
Bacsa, Gyorgy: *See*—
Kekesi, Sandor; Tamasi, Piroska; Pal, Veronika; Jancso, Sandor; Kristof nee Szvitil, Ilona; Bacsa, Gyorgy; and Kovacs nee Hadady, Katalin, 4,803,069, Cl. 424-74.000.
Bader, Richard. Wreath making machine. 4,802,271, Cl. 29-243.560.
Bader, Stefano: *See*—
Brunetta, Fabio; Bader, Stefano; and Pantini, Giovanni, 4,803,067, Cl. 424-63.000.
Bagard, Michel: *See*—
Saint-Jean, Alain; and Bagard, Michel, 4,802,373, Cl. 74-359.000.
Baier, Manfred; Kaspar, Klaus P.; Schafer, Rainer; Trager, Ulrich; and Notzel, Siegfried, to Boehringer Mannheim GmbH. Reagent paper for immunologically analysis, a process for the preparation thereof and the use thereof. 4,803,171, Cl. 436-530.000.
Bailey, Russell: *See*—
Aidlin, Stephen H.; and Bailey, Russell, 4,802,569, Cl. 198-346.100.
Bain, William L., Jr.; Bedichek, Robert C.; Cox, George W.; Grassl, Gerhard; Peterson, Craig B.; Rattner, Justin R.; Singh, Gurbir; Singh, Gurbir; and Wipfli, John L., to Intel Corporation. Programmable I/O sequencer for use in an I/O processor. 4,803,622, Cl. 364-200.000.
Bair, Kenneth W., to Burroughs Wellcome Co. Anthracene derivatives. 4,803,221, Cl. 514-510.000.
Bair, Kenneth W., to Burroughs Wellcome Co. Fluoranthene derivatives. 4,803,222, Cl. 514-510.000.
Bair, Kenneth W., to Burroughs Wellcome Co. Anthracene derivatives. 4,803,226, Cl. 514-655.000.
Baker, Don R., to Stauffer Chemical Co. Herbicide antidotes. 4,802,912, Cl. 71-100.000.
Baker, James K., to Dragon Systems, Inc. Speech recognition method. 4,803,729, Cl. 381-43.000.
Bakke, Arlan N. Fire-fighting tool. 4,802,535, Cl. 169-70.000.
Balchem Corporation: *See*—
Weiss, Herbert D.; and Reynolds, Robert G., 4,803,092, Cl. 426-646.000.
Baldwin, John J.; Ponticello, Gerald S.; Remy, David C.; Claremon, David A.; and King, Stella W., to Merck & Co., Inc. Amino-2-hydroxypropyloximinoheterocycle α-blockers. 4,803,286, Cl. 514-431.000.
Ball, Keith R.; and Thompson, David M. Laboratory animal carrier filter bag. 4,802,900, Cl. 55-381.000.
Ball, Patrick J. R.; and Vaughan, David N., to U.S. Philips Corp. Infrared radiation detector with flanged semiconductor window. 4,803,360, Cl. 250-338.300.
Balogh, Maria: *See*—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Meszaros, Zoltan, deceased; Ritli, Peter; Sipos, Judit; and Pajor, Aniko , 4,803,274, Cl. 546-13.000.
Baloh, Frank J.: *See*—
Gilmore, Charles B.; Kisak, James L.; Oberst, Jeffrey P.; Wood, John D.; and Baloh, Frank J., 4,803,042, Cl. 376-272.000.
Balzano, Alfiero; and Dove, Dan. Connector. 4,802,866, Cl. 439-496.000.
Banba, Fumiyasu; and Okami, Yoshinori, to Hitachi, Ltd. System for retrieving distributed information in a data base. 4,803,614, Cl. 364-200.000.
Bankoku Needle Manufacturing Co., Ltd.: *See*—
Takahashi, Masamitsu, 4,802,581, Cl. 206-380.000.
Bansal, Ravinder K.: *See*—
Vrana, Edward E.; and Bansal, Ravinder K., 4,802,899, Cl. 55-161.000.
Barbour, Gary W. Beverage can cleaner. 4,802,927, Cl. 134-6.000.
Barclay, Randel L. Apparatus and method for compacting a scrap tire. 4,802,635, Cl. 241-30.000.
Bark, Jeffrey E.: *See*—
Weeks, Vaughan B.; and Bark, Jeffrey E., 4,802,885, Cl. 604-93.000.
Barowski, Karlheinz; and Helbig, Gunter, to Braun Aktiengesellschaft. Cordless curling iron with separate electric heating station. 4,803,341, Cl. 219-222.000.
Barraud, Andre ; Ruaudel, Annie; and Vandevyver, Michel, to Commissariat a l'Energie Atomique. Electrically conducting films comprising at least one monomolecular layer of an organic charge transfer complex. 4,803,011, Cl. 252-500.000.
Barrell, David; Griffith, Gerald P.; Kennedy, Donald E.; and Rollen, Doanld C., to Glasteel Industrial Laminates, Inc. Method of continuously bonding and curing a zinc-coated metal-clad polyester-epoxy-glass fiber laminate. 4,803,022, Cl. 264-25.000.
Barrow, William A.; and Schmachtenberg, Richard, III, to Planar Systems, Inc. Method of encapsulating TFEL panels with a curable resin. 4,802,873, Cl. 445-6.000.
Bartels, Craig R.; and Reale, John, Jr., to Texaco Inc. Dehydration of glycols. 4,802,988, Cl. 210-640.000.
Barthelmes, Norbert, to Siemens Medical Laboratories, Inc. Assembly and method for monitoring the lateral position of a beam of ionizing radiation. 4,803,368, Cl. 250-385.100.
Bartholomew, Donald D., to Proprietary Technology, Inc. Means of locking tubes into engagement with a pressure fitting. 4,802,697, Cl. 285-319.000.
Bartholomew, Victor L., to Becton Dickinson and Company. Apparatus for attaching a catheter to a hub. 4,802,947, Cl. 156-380.500.
Basavaiah, Saryadevara: *See*—
Ahn, Kie Y.; Basavaiah, Saryadevara; Brodsky, Stephen B.; Cortellino, Charles A.; and Levine, Joseph E., 4,803,110, Cl. 428-137.000.

BASF Aktiengesellschaft: *See*—
Dockner, Toni; Kempe, Uwe; and Koehler, Hermann, 4,803,283, Cl. 548-339.000.
Hellwig, Gerhard; Baur, Ottmar; Feisst, Klaus; Moehwald, Helmut; and Muenstedt, Helmut, 4,803,596, Cl. 361-525.000.
Mesch, Walter, 4,803,281, Cl. 548-335.000.
Mueller, Herbert, 4,803,299, Cl. 560-240.000.
Ostertag, Werner; Czech, Erwin; Schmitt, Franz-Ulrich; and Schulze-Hagenest, Detlef, 4,803,143, Cl. 430-106.600.
Puetter, Hermann; and Roske, Eckhard, 4,802,965, Cl. 204-182.400.

BASF Corporation: *See*—
Midgley, Charles A.; and Chick, Orest N., 4,803,240, Cl. 524-504.000.
Narayan, Thirumurti; Pray, Edward R.; and Stoll, John R., 4,803,229, Cl. 521-160.000.

Batcheller, Barry D.: *See*—
Nystuen, Paul A.; Batcheller, Barry D.; Brekkestran, Kevin L.; and Kraning, Calvin J., 4,802,545, Cl. 180-135.000.

Bates, Kenneth W., to Injectall Limited. Apparatus for injecting substances into liquids. 4,802,655, Cl. 266-218.000.

Bator, Feliks; Hunter, Kevin D.; and Durst, Robert T., Jr., to Pitney Bowes Inc. Weighing scale with voice coil. 4,802,541, Cl. 177-212.000.

Battelle Memorial Institute: *See*—
Muralidhara, Harapanahalli S.; and Criner, Cecil L., 4,802,964, Cl. 204-180.100.

Bauer, Karl-Heinz; and Eckert, Gerold, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co. Electric manual switching device having environmentally protected components. 4,803,323, Cl. 200-302.200.

Bauerle, David D.; and Rabotnick, Barry I., to Colt Industries Inc. Air cleaner cover and base for dual carburetor assemblies. 4,802,902, Cl. 55-484.000.

Baugus, Donald G. Gun cylinder lock device. 4,802,298, Cl. 42-70.110.

Baur, Ottmar: *See*—
Hellwig, Gerhard; Baur, Ottmar; Feisst, Klaus; Moehwald, Helmut; and Muenstedt, Helmut, 4,803,596, Cl. 361-525.000.

Baus, Heinz G. Frame, more particularly for a picture. 4,802,294, Cl. 40-155.000.

Bausch & Lomb Incorporated: *See*—
Hensler, J. Raymond, 4,802,755, Cl. 351-163.000.

Bayer Aktiengesellschaft: *See*—
Brandes, Wilhelm; Reinecke, Paul; Kaspers, Helmut; Scheinpflug, Hans; and Stetter, Jorg, 4,803,214, Cl. 514-383.000.
Dietrich, Manfred; Pedain, Josef; Konig, Klaus; and Hohlein, Peter, 4,803,246, Cl. 525-124.000.
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,803,215, Cl. 514-407.000.
Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Santel, Hans-Joachim; and Schmidt, Robert R., 4,802,910, Cl. 71-93.000.

Bayer Aktiengesellschaft & Chinese: *See*—
Hartwig, Wolfgang, 4,803,285, Cl. 548-551.000.

Bays, Marvin G., to Mertz, Inc. Electrical control system. 4,802,787, Cl. 404-90.000.

BBC Brown Boveri AG: *See*—
Krietmeier, Franz, 4,802,821, Cl. 415-210.000.
Maschek, Martin; Mastner, Georg; and Tomic, Branko, 4,802,731, Cl. 350-96.230.

BBC Brown, Boveri & Company, Ltd.: *See*—
Lageder, Heinrich; Masek, Jaroslav; and Prochazka, Kamil, 4,802,403, Cl. 91-374.000.

Beale, William T., to Sunpower, Inc. Sliding surface lubrication particularly advantageous for a free piston stirling engine. 4,802,332, Cl. 60-520.000.

Beard, Charles D.: *See*—
Dunks, Gary B.; Yamada, Akira; Doddi, Namassivaya; and Beard, Charles D., 4,803,254, Cl. 525-477.000.

Beard, Michael D., to Herman Miller, Inc. Work surface ganging clip. 4,802,422, Cl. 108-64.000.

Beaudrie, Robert J. Process for refurbishing containers. 4,802,272, Cl. 29-407.070.

Beboux, Jean, to Societe Europeenne de Propulsion. Internal anti-popping assembly for solid propellant rocket motor and its manufacturing process. 4,803,038, Cl. 264-3.300.

Becker, Benedikt: *See*—
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,803,215, Cl. 514-407.000.

Becker, Michael W.: *See*—
Najjar, Mitri S.; and Becker, Michael W., 4,803,061, Cl. 423-415.00A.

Becton Dickinson and Company: *See*—
Bartholomew, Victor L., 4,802,947, Cl. 156-380.500.

Becze, Garry J.: *See*—
McBain, Robert M.; Becze, Garry J.; Kruppert, Friedrich W.; and Leistner, Jack W., 4,803,037, Cl. 266-78.000.

Bedichek, Robert C.: *See*—
Bain, William L., Jr.; Bedichek, Robert C.; Cox, George W.; Grassl, Gerhard; Peterson, Craig B.; Rattner, Justin R.; Singh, Gurbir; Singh, Gurbir; and Wipfli, John L., 4,803,622, Cl. 364-200.000.

Beecham Group plc: *See*—
Berge, John; and Hindley, Richard M., 4,803,293, Cl. 560-42.000.

Beery, Jack, to Mead Corporation, The. Movable cartridge lock. 4,802,633, Cl. 242-71.100.

Beevers, Katherine K. Protective cover for tracheotomy tube. 4,802,474, Cl. 128-200.260.

Behrenz, Wolfgang: *See*—
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,803,215, Cl. 514-407.000.

Beikirch, Thomas R., to Xerox Corporation. Scan lamp intensity control for raster input scanners. 4,803,556, Cl. 358-228.000.

Belgard, Richard A.: *See*—
Bernstein, David H.; Wallach, Walter A.; Richmond, Michael S.; Ahlstrom, John K.; Pilat, John F.; Farber, David A.; Belgard, Richard A.; and Bratt, Richard G., 4,803,619, Cl. 364-200.000.

Bell Helicopter Textron Inc.: *See*—
Gaston, Lynn S., 4,802,861, Cl. 439-247.000.

Bell, James A. E.: *See*—
Victorovich, Grigori S.; Diaz, Carlos M.; O'Neill, Charles E.; Bell, James A. E.; and Timberg, Lloyd M., 4,802,916, Cl. 75-24.000.

Belly, Robert T.: *See*—
Babb, Bruce E.; Belly, Robert T.; and Mura, Albert J., 4,803,161, Cl. 435-29.000.

Bender, James W.: *See*—
Kuhn, Timothy J.; Bender, James W.; and Thekdi, Arvind C., 4,802,844, Cl. 432-126.000.

Bender, Paul E.; Lantos, Ivan; McGuire, Michael A.; Pridgen, Lendon N.; and Winicov, Herbert B., to SmithKline Beckman Corporation. 1.4-dihydro-4-pyridyl-substituted imidazo (2,1-b) thiazoles and the corresponding thiazines. 4,803,279, Cl. 546-271.000.

Bender, Ulrich, to Emil Bender, Firma. Lattice. 4,803,128, Cl. 428-577.000.

Bendfeld, Dwayne. Portable dike system. 4,802,322, Cl. 52-601.000.

Benedikt, Gerald; and Steinijans, Volker, to BYK Gulden Lomberg Chemische Fabrik. Sustained-release theophylline formulation. 4,803,080, Cl. 424-488.000.

Benesch, Jay F., to General Electric Company. Superconductive switch. 4,803,456, Cl. 338-32.00S.

Benge, S. Eugene, to Monarch Marking Systems, Inc. Method of making deactivatable tags. 4,802,944, Cl. 156-247.000.

Bennett, Robert E., to Deere & Company. Agricultural concave adjustment means. 4,802,496, Cl. 130-27.00S.

Bennett, William R.; Mix, Tom; and Smith, James F. Motorcycle floorboard device. 4,802,684, Cl. 280-291.000.

Benton, Terry L.: *See*—
Dirkin, William; Peters, Fred; and Benton, Terry L., 4,802,404, Cl. 92-171.000.

Berarducci, Thomas N., to Eastman Kodak Company. Multi-processor using shared buses. 4,803,617, Cl. 364-200.000.

Berberich, Bernd; and Reinhold, Holger, to Tampoflex GmbH. Device for adjusting a set of workpiece mounts in defined working positions. 4,802,565, Cl. 198-345.000.

Berg, Franco; and Bovermann, Claus-Dieter, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Housing for electrotechnical equipment. 4,802,589, Cl. 206-511.000.

Berge, John; and Hindley, Richard M., to Beecham Group plc. Tertiary amines. 4,803,293, Cl. 560-42.000.

Berlekamp, Elwyn R.; Bixby, James A.; and Lemke, James U., to Eastman Kodak Company. Digital time base correction using a reference bit. 4,803,566, Cl. 360-26.000.

Berlincourt, Yves; and Mouchot, Alain, to Tecalemit Flexibles S.A. High-pressure hose and a process for its production. 4,802,510, Cl. 138-125.000.

Bernard, Georges; Bouvet, Bernard; Jacolin, Richard; Colleoni, Guido; Gaillard, Jacques; and Volsy, Robert, to Merlin Gerin. Rotary switch with curved arc root migration track. 4,803,319, Cl. 200-147.00A.

Bernet, Yvon: *See*—
Combourieu, Michel; Simbille, Nadine; Landes, Marie-Paule; and Bernet, Yvon, 4,803,219, Cl. 514-469.000.

Bernstein, David H.; Wallach, Walter A.; Richmond, Michael S.; Ahlstrom, John K.; Pilat, John F.; Farber, David A.; Belgard, Richard A.; and Bratt, Richard G. Digital data processing system incorporating apparatus for resolving names. 4,803,619, Cl. 364-200.000.

Berryhill, John R.; and Wride, John C., to Exxon Production Research Company. Method of 3-D seismic imaging for structures with approximate circular symmetry. 4,803,668, Cl. 367-72.000.

Bertram, Leo; Schemmann, Hugo; and Bukoschek, Romuald L., to U.S. Philips Corporation. Dual motor drive arrangement for a small domestic appliance. 4,803,390, Cl. 310-50.000.

Bertrand, Vic, to Ritvik Group Inc., The. Axle structure and axle joint for construction toy assembly. 4,802,876, Cl. 446-95.000.

Bevel, Kenneth E.: *See*—
Graham, William H.; Bevel, Kenneth E.; Byrd, James D.; Junior, Kenneth E.; and Shepard, Inella G., 4,803,019, Cl. 264-3.100.

Bevington, Jack T.; and Channell, Alan B., to McNeil (Ohio) Corporation. Centrifugal pump. 4,802,819, Cl. 415-199.300.

Bewley, Wilbur C., Jr.: *See*—
Lahndorff, Kendell S.; and Bewley, Wilbur C., Jr., 4,802,254, Cl. 15-41.00R.

Bhadra, Dilip K.; Creedon, Richard L.; Harder, C. Ross; and Bourque, Robert F., to General Atomics. Combined wheel/brake apparatus using electro-rheological fluid. 4,802,560, Cl. 188-264.00F.

Bhardwaj, Chhaya: *See*—
Khan, Mirza M. T.; Bhardwaj, Ramesh C.; and Bhardwaj, Chhaya, 4,802,963, Cl. 204-157.500.
Bhardwaj, Ramesh C.: *See*—
Khan, Mirza M. T.; Bhardwaj, Ramesh C.; and Bhardwaj, Chhaya, 4,802,963, Cl. 204-157.500.
BHS - Bayerische Berg-, Hutten- and Salzwerke AG: *See*—
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Bidwell, Howard, to Masiuk, Stephen. Method of and apparatus for improving the efficiency of internal combustion engines. 4,802,335, Cl. 60-274.000.
Biegel, Donald R., to Tri-Albi Corporation. Ship hull construction. 4,802,427, Cl. 114-61.000.
Bierleutgeb, Fritz. Autofocusing system for a microscope and method of using the same. 4,803,352, Cl. 250-201.000.
Bierschenk, Thomas R.: *See*—
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Billarant, Patrick J.; and Queval, Bruno, to Aplix, S.A. Method for attaching a fastening tape to a molded article. 4,802,939, Cl. 156-155.000.
Billiet, Jeannine. Fluoride-free flux compositions for hot galvanization in aluminum-modified zinc baths. 4,802,932, Cl. 148-23.000.
Bills, Earl C. Portable multiple section adjustable posture contour care bed. 4,802,249, Cl. 5-420.000.
Binderman, Melvin D.; and Casey, Joseph N., to Central Soya Company, Inc. Method of deoiling crude lecithin. 4,803,016, Cl. 260-403.000.
BioChem Technology: *See*—
Krause, Richard J.; Lee, Jaw F.; and Breckenridge, Craig W., 4,803,365, Cl. 250-461.200.
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Kekesi, Sandor; Tamasi, Piroska; Pal, Veronika; Jancso, Sandor; Kristof nee Szvitil, Ilona; Bacsa, Gyorgy; and Kovacs nee Hadady, Katalin, 4,803,069, Cl. 424-74.000.
Biological Rescue Products, Inc.: *See*—
Krasner, Paul R., 4,802,853, Cl. 433-215.000.
Birkle, Alan D., to Motorola, Inc. Self-fixturing heat sink. 4,803,545, Cl. 357-81.000.
Birmingham, Peter C. Baseball training device. 4,802,669, Cl. 273-26.00C.
Bixby, James A.: *See*—
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Black, Laura E., to Exxon Research and Engineering Company. Selective permeation of aromatic hydrocarbons through polyethylene glycol impregnated regenerated cellulose or cellulose acetate membranes. 4,802,987, Cl. 210-640.000.
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Hardy, Richard; and Neumann, Frank D., 4,802,641, Cl. 244-137.400.
Jones, Everett E., 4,802,357, Cl. 72-389.000.
Klees, Garry W., 4,802,629, Cl. 239-265.190.
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Shorey, Thomas H.; and Shorey, Mark W., 4,802,572, Cl. 198-791.000.
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Gastos, Lynn S., 4,802,861, Cl. 439-247.000.
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Boge AG: *See*—
Knecht, Heinz; and Ackermann, Norbert, 4,802,561, Cl. 188-318.000.
Bonini, Giorgio: *See*—
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Bonora, Anthony C.; and O'Sullivan, Andrew W., to Asyst Technologies. Manipulator for standard mechanical interface apparatus. 4,802,809, Cl. 414-217.000.
Boocock, John R. B., to Du Pont Canada Inc. Continuous process for the dyeing of polymers. 4,802,886, Cl. 8-489.000.
Boon, David G. Dental-porcelain color matching system. 4,802,850, Cl. 433-26.000.
Borden, Inc.: *See*—
Mottur, George P.; Peters, Norman E.; and Nietz, Ron L., 4,803,091, Cl. 426-439.000.
Boriani, Silvano: *See*—
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Born, Gerhard; Elsner, Paul; and Scherer, Heinz-Jurgen, to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft. Apparatus for conveying suspended bottles. 4,802,571, Cl. 198-627.000.
Borne, Andre ; and Jusseau, Marcel, to Cgee Alsthom. Opto-electronic connection device. 4,802,725, Cl. 350-96.200.
Borzatta, Valerio: *See*—
Cantatore, Giuseppe; and Borzatta, Valerio, 4,803,234, Cl. 524-100.000.
Boss, Margareta: *See*—
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Boston University, Trustees of: *See*—
Clark, Noel A.; Douglas, Kenneth; and Rothschild, Kenneth J., 4,802,951, Cl. 156-630.000.
Grossberg, Stephen; and Mingolla, Ennio, 4,803,736, Cl. 382-22.000.
Boucher, Andre: *See*—
Terrasse, Joseph J.; Boucher, Andre; and Seux, Michel, 4,802,528, Cl. 164-428.000.
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Boutier, Philippe; and Vanaschen, Luc, to Saint-Gobain Vitrage. Method and apparatus for positioning of glass plates to bend them into a convex shape. 4,802,904, Cl. 65-106.000.
Boutigny, Pierre-Henri, to U.S. Philips Corp. Input circuit for a probe of a logic analyser and probe and logic analyser provided with such a circuit. 4,803,423, Cl. 324-130.000.
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Berg, Franco; and Bovermann, Claus-Dieter, 4,802,589, Cl. 206-511.000.
Bowcutt, Corey H.; Buckley, John J., Jr.; and Rew, James A., to Westinghouse Electric Corp. Apparatus for printed wiring board component assembly. 4,802,276, Cl. 29-739.000.
Bowen, John M.; Sullivan, Patrick J.; Blanche, M. Sterling; Essington, Michael; and Noe, Lewis J., to Western Research Institute. Optical-fiber raman spectroscopy used for remote in-situ environmental analysis. 4,802,761, Cl. 356-301.000.
Bower, Robert W., to Advanced Micro Devices, Inc. Integrated circuit structure with active device in merged slot and method of making same. 4,803,176, Cl. 437-33.000.
Bowers, David L.; and Kienle, Gunther W., to Sentel Technologies, Inc. Sleep apnea monitor. 4,802,485, Cl. 128-633.000.
Bownds, Royce D. Magnetic lifting tool. 4,802,702, Cl. 294-65.500.
Bowsky, Benjamin; Honkomp, Glenn A.; Burrows, Larry G.; and Wilson, Edward E., to Emerson Electric Co. Method of manufacturing a safety vented container and product. 4,803,136, Cl. 429-56.000.
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Bracco, Anthony C.: *See*—
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Brammall, Terrence N.: *See*—
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Brandes, Lorne J.; and Hermonat, Mark W., to University of Manitoba, The. Aminoalkyl ethers of phenols as anticancer agents for the breast and colon. 4,803,227, Cl. 514-651.000.
Brandes, Wilhelm; Reinecke, Paul; Kaspers, Helmut; Scheinpflug, Hans; and Stetter, Jorg, to Bayer Aktiengesellschaft. Fungicidal active compound combinations. 4,803,214, Cl. 514-383.000.
Brandolf, Henry E. Wraparound closure for conduit protection. 4,802,509, Cl. 138-110.000.
Brannstrom, Roine, to ASEA-Stal AB. Pressure-reducing device for particulate material. 4,802,796, Cl. 406-141.000.
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Brewster, Andrew G.; Brown, George R.; and Smithers, Michael J., to Imperial Chemical Industries PLC. Pharmaceutical agents. 4,803,220, Cl. 514-452.000.
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Britos, Jose D., to Asecom S.C.L. Interface between personal computer and telex communication system. 4,803,312, Cl. 178-17.00R.
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Bruce, William H., Jr., to Eastman Kodak Company. Multi-mode electrophotographic reproduction apparatus. 4,803,517, Cl. 355-3.0CH.
Brunetta, Fabio; Bader, Stefano; and Pantini, Giovanni, to Ausimont S.p.A. Compositions for cosmetics and dermatology comprising perfluoropolyethers. 4,803,067, Cl. 424-63.000.
Brunner, Hans-Georg; and Muller, Urs, to Ciba-Geigy Corporation. Process for the preparation of cyclohexanedionecarboxylic acid derivatives. 4,803,268, Cl. 544-58.400.
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Bte, Ulrich, ml/u/ hler; Tappe, Horst; Kuhn, Reinhard; Bode, Albert; and Boss, Margareta, to Cassella Aktiengesellschaft. 2-cyano-4,6-dinitrophenyl mono-azo dyes for polyester and cellulose acetate. 4,802,889, Cl. 8-639.000.
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Bukoschek, Romuald L.: *See*—
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Burgdorf, Jochen; and Latka, Franz, to Alfred Teves GmbH. Electric switching device. 4,802,710, Cl. 303-11.000.
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Burgess, James F.; Glascock, Homer H., II; Webster, Harold F.; Neugebauer, Constantine A.; and Loughran, James A., to General Electric Company. Multilayer circuit board fabricated from silicon. 4,803,450, Cl. 333-238.000.
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Burke Company, The: *See*—
Kelly, David L.; and Needham, Jeffrey R., 4,802,316, Cl. 52-90.000.
Burke, Michael A.; and Lessmann, Gerald G., to Westinghouse Electric Corp. Method for laser beam welding metal matrix composite components. 4,803,334, Cl. 219-121.640.
Burke, Michael J.; Pidsosny, Richard A.; and Lehner, Gerald J., to Ford Motor Company. Electronic odometer. 4,803,646, Cl. 364-561.000.
Burnand, Richard P.; and Mackenzie, Kenneth A. Composite diamond abrasive compact. 4,802,895, Cl. 51-293.000.
Burnham, Robert D.: *See*—
Scifres, Donald R.; Kung, Hsing; Cross, Peter; Burnham, Robert D.; and Streifer, William, 4,803,691, Cl. 372-150.000.
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Burpitt, Robert D.: *See*—
Weaver, Max A.; Pruett, Wayne P.; Hilbert, Samuel D.; and Burpitt, Robert D., 4,803,241, Cl. 524-719.000.
Burroughs Wellcome Co.: *See*—
Bair, Kenneth W., 4,803,221, Cl. 514-510.000.
Bair, Kenneth W., 4,803,222, Cl. 514-510.000.
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Burrows, Larry G.: *See*—
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Burton, Larry W., to Avnet, Inc. Programmable electronic antenna rotator. 4,803,412, Cl. 318-567.000.
Busch, Peter: *See*—
Ploog, Uwe; Busch, Peter; Thiele, Klaus; Hoffkes, Horst; and Giede, Karl, 4,803,068, Cl. 424-70.000.
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Buschor, Karl, to Ransburg-Gema AG. Electrostatic spray coating device for coating with powder. 4,802,625, Cl. 239-3.000.
Buseki, Hiroo: *See*—
Fujisawa, Katsuhide; Takanaka, Toshimasa; Buseki, Hiroo; and Takahashi, Masakatsu, 4,802,698, Cl. 285-363.000.
Bussian, Alfred E.; Williams, Thomas M.; Carmichael, Paul D.; and Paap, Hans J., to Texaco Inc. Production stream analyzer. 4,802,361, Cl. 73-61.10R.
Butcher, Ronald S.; and Khattab, Mohamed A., to National Steel Car Limited. Centre beam railroad car. 4,802,420, Cl. 105-355.000.
Butka, Kemal. Vessel such as a ship, boat and the like provided with stabilizing means. 4,802,429, Cl. 114-124.000.
Butts, Gary C., to Labworks, Inc. Electro-optically activated switch with tactile feedback. 4,803,362, Cl. 250-229.000.
Buzzi, Carlo A.: *See*—
Mader, Karl; Schonenberger, Guido; and Buzzi, Carlo A., 4,802,480, Cl. 128-400.000.
BYK Gulden Lomberg Chemische Fabrik: *See*—
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Byrd, James D.: *See*—
Graham, William H.; Bevel, Kenneth E.; Byrd, James D.; Junior, Kenneth E.; and Shepard, Inella G., 4,803,019, Cl. 264-3.100.
Bzdak, Richard J., to Cooper Industries, Inc. Surge arrester. 4,803,588, Cl. 361-118.000.
C. R. Bard, Inc.: *See*—
Haber, Terry M.; and Smedley, William H., 4,802,479, Cl. 128-344.000.
Cable, Thomas L.: *See*—
Mazanec, Terry I.; and Cable, Thomas L., 4,802,958, Cl. 204-80.000.
Cage, Donald R.; and Zolock, Michael J. Angular rate sensor. 4,802,364, Cl. 73-505.000.
Caile, Christopher R.: *See*—
Neil, James E.; Demjanenko, Victor; and Caile, Christopher R., 4,803,718, Cl. 379-163.000.
Cairns, John F., to Imperial Chemical Industries PLC. Treatment of cathodes for use in electrolytic cell. 4,802,962, Cl. 204-145.00R.
Calderara, Reto; Sonderegger, Hans-Conrad; and Wolfer, Peter, to Kristal Instrumente AG. Multi-component dynamometers. 4,802,371, Cl. 73-862.040.
Calevo, Robert: *See*—
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California Institute of Technology: *See*—
Kyuma, Kazuo; Kwong, Sze-Keung; and Yariv, Amnon, 4,803,429, Cl. 324-244.000.
Neurath, Alexander R.; Kent, Stephen B. H.; and Strick, Nathan, 4,803,156, Cl. 435-7.000.
Calvert, Rodney K.; and Wood, Prentice J., to Mead Corporation, The. Article container with overwrap. 4,802,583, Cl. 206-427.000.
Calzaturificio Tecnica Spa: *See*—
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Candela Laser Corporation: *See*—
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Akashi, Akira; and Yamada, Masanori, 4,803,507, Cl. 354-400.000.
Baba, Takeshi; Suda, Shigeyuki; Nose, Noriyuki; Kawakami, Eigo; Nakajima, Toshiyuki; and Kushibiki, Nobuo, 4,802,746, Cl. 350-418.000.
Haruta, Masahiro; Ozawa, Kunitaka; and Hamamoto, Takashi, 4,802,989, Cl. 210-688.000.
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Hoshino, Osamu; and Chiku, Kazuyoshi, 4,803,515, Cl. 355-4.000.
Hotta, Yoshio; Ohnuma, Kenji; and Komura, Akihiko, 4,802,740, Cl. 350-341.000.
Ishihara, Shunichi; Saito, Keishi; Oda, Shunri; and Shimizu, Isamu, 4,803,093, Cl. 427-35.000.
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Kashida, Motokazu; Masui, Toshiyuki; Fukatsu, Tsutomu; Takahashi, Koji; Takei, Masahiro; and Nagasawa, Kenichi, 4,803,570, Cl. 360-61.000.
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Maeno, Hiroshi; and Tamamura, Hideo, 4,803,504, Cl. 354-64.000.
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Takao, Hideaki; Motoi, Taiko; Sekimura, Nobuyuki; Kamio, Masaru; and Murata, Tatsuo, 4,802,743, Cl. 350-339.00F.
Tomosada, Masahiro; Ogawa, Hiroshi; Tohyama, Yoshikuni; Adachi, Hideki; Suzuki, Tadashi; and Ohki, Naoyuki, 4,803,520, Cl. 355-7.000.
Yamada, Yasuaki, 4,802,777, Cl. 400-144.200.
Cantatore, Giuseppe; and Borzatta, Valerio, to Ciba-Geigy Corporation. Piperidine compounds and their use as anti-oxidative, light or thermal induced degradation agents. 4,803,234, Cl. 524-100.000.
Cantrell, John L.; and Rudbach, Jon A., to Ribi ImmunoChem Research Inc. Immunological emulsion adjuvants for polysaccharide vaccines. 4,803,070, Cl. 424-92.000.
Caprathe, Bradley W.; DeWald, Horace A.; Jaen, Juan C.; and Wise, Lawrence D., to Warner-Lambert Company. Phenyl and heterocyclic piperazinyl alkoxy-benzheterocyclic compounds as antipsychotic agents. 4,803,203, Cl. 514-230.500.
Carden, Timothy F.: *See*—
Ameen, Joseph G.; Carden, Timothy F.; Cutting, Lawrence R.; Engle, Stephen R.; and Moore, Ronald J., 4,803,100, Cl. 427-387.000.
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Gerlinger, Hermann; Hohberg, Gerhard; and Schneider, Horst, 4,802,763, Cl. 356-319.000.
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Carlingswitch, Inc.: *See*—
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Carmichael, Paul D.: *See*—
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Carson, Douglas W., to Thomas Industries, Inc. Plaster frame. 4,803,603, Cl. 362-150.000.
Caruel, Jacques E. J., to Societe Nationale d-Etude et de Construction de Moteurs d-Aviation (SNECMA). Flameholder for a turbojet engine afterburner. 4,802,337, Cl. 60-749.000.
Carver, Robert W.; and Croft, James J. Loudspeaker diaphragm mounting system and method. 4,803,733, Cl. 381-193.000.
Casco Products Corporation: *See*—
Lupoli, Peter J.; and Mattis, Donald J., 4,803,320, Cl. 200-342.000.
Casey, Joseph N.: *See*—
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Casio Computer Co., Ltd.: *See*—
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Casella Aktiengesellschaft: *See*—
Bte, Ulrich, ml/u/ hler; Tappe, Horst; Kuhn, Reinhard; Bode, Albert; and Boss, Margareta, 4,802,889, Cl. 8-639.000.
Catalysts & Chemicals Industries Co., Ltd.: *See*—
Fukuda, Morio; Hanada, Masayuki; Inutsuka, Hideo; and Ogata, Katsuya, 4,802,840, Cl. 425-464.000.
Caterpillar Inc.: *See*—
Ryerson, Lee T., 4,802,537, Cl. 172-812.000.
Cattani, Augusto, to Officine Augusto Cattani & C. S.p.A. Clamp fitting, in particular for pipes and tube. 4,802,646, Cl. 248-316.500.
Cavaca, Roger, to Bucci, Andrew A., a part interest. Vehicle repair apparatus. 4,802,358, Cl. 72-308.000.
Celanese Corporation: *See*—
Rosenfeld, Jerold C., 4,803,236, Cl. 524-83.000.
Celmayster, James M.; and Clenet, Alain J-M. Trash bag holder. 4,802,647, Cl. 248-544.000.
Central Glass Company, Limited: *See*—
Inaba, Hiroshi; Shinnai, Masao; Nishikawa, Kazuya; Saitoh, Tamotsu; and Tsukada, Tokio, 4,803,492, Cl. 343-713.000.
Central Machine and Tool Co.: *See*—
Vargo, Edward E., 4,802,694, Cl. 285-87.000.
Central Soya Company, Inc.: *See*—
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Centre de Recherches Metallurgiques-Centrum Voor Research in De Metallurgie: *See*—
Monfort, Guy A.; and Bragard, Adolphe A., 4,803,374, Cl. 250-571.000.
Centre National de la Recherche Scientifique: *See*—
Rousset, Abel; Salvaing, Christiane B.; Mollard, Paul; Manoux, Alain; and Tailhades, Philippe, 4,803,291, Cl. 556-31.000.
Centro de Investigacion y de Estudios Avanzados Del Instituto Politecnico Nacional: *See*—
Joseph-Nathan, Pedro; and Morales-Rios, Martha S., 4,803,284, Cl. 548-497.000.
Cetus Corporation: *See*—
Levenson, Corey H.; and Mullis, Kary B., 4,803,297, Cl. 560-159.000.
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Cgee Alsthom: *See*—
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Chadwick Industries Pty. Limited: *See*—
Mansell, William T., 4,803,111, Cl. 428-139.000.
Chaffee, Edwin G., to American Laser Corporation. Cold welded laser mirror assembly. 4,803,697, Cl. 372-107.000.
Champion International Corporation: *See*—
Phillips, Robert D., 4,802,620, Cl. 229-125.420.
Champlin, George B.; and Swan, Charles F., to New England Braiding, Inc. Diagonally reinforced mechanical packing. 4,802,398, Cl. 87-8.000.
Chandler, David R., to Foresight Industries, Inc. Ground anchor. 4,802,317, Cl. 52-163.000.
Chang, Mike F.; Yilmaz, Hamza; Gauffreau, George L.; and Owyang, King, to General Electric Company. IGT and MOSFET devices having reduced channel width. 4,803,533, Cl. 357-23.400.
Channell, Alan B.: *See*—
Bevington, Jack T.; and Channell, Alan B., 4,802,819, Cl. 415-199.300.
Chapdelaine, Albert H.; Kures, Vasek J.; and Grey, Ronald T., to Wm. Wrigley Jr. Company. Method of optimizing texture and processability of chewing gums and compositions made therefrom. 4,803,083, Cl. 426-3.000.
Chapel, Roy W., Jr.; Duperon, David N.; and Meadows, Joseph E. Compound resistor and manufacturing method therefore. 4,803,457, Cl. 338-195.000.
Chasco, David G.: *See*—
Petersen, Niel R.; and Chasco, David G., 4,802,367, Cl. 73-805.000.
Chatfield, Philip A.; and Shapiro, Eugene, to Olin Corporation. Optical fiber cables for motor vehicle engine compartment applications. 4,802,730, Cl. 350-96.230.
Chatterjee, Dipak K.: *See*—
Dhar, Rajkumar; Venugopalan, Bindumadhavan; Chatterjee, Dipak K.; Rupp, Richard H.; and de Souza, Noel J., 4,803,204, Cl. 514-232.800.
Chavanne - Ketin: *See*—
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Chaveron, Michel; and Neumann, Fred, to Nestec S.A. Process for treating dairy by-products. 4,803,089, Cl. 426-239.000.
Cheek, Gary C.; and Rice, Andy, to Dow Chemical Company, The. Pour spout. 4,802,610, Cl. 222-481.500.
Chen, Ming-Hui, to Lin, Li-Ling. Ultrasonic ranging device. 4,803,670, Cl. 367-99.000.
Chen, Nai Y.; Degnan, Thomas F.; and Weisz, Paul B., to Mobil Oil Corporation. Shape selective crystalline silicate zeolite containing intermetallic component and use as catalyst in hydrocarbon conversions. 4,803,186, Cl. 502-66.000.
Chen, Shallop J.; and Johansson, Jan, to Advanced Micro Devices, Inc. Reset and synchronization interface circuit. 4,803,702, Cl. 375-106.000.
Chen, Shun; and Lee, Chin-Sheng, to Westinghouse Electric Corp. Bell seal of improved stability for high pressure turbines. 4,802,679, Cl. 277-12.000.
Chen, Shye L., to Tatung-Conair Corporation. Two-purpose device of hand and hair dryers. 4,802,287, Cl. 34-91.000.
Cheng, H. T., to Lisonic Electronic Co. Ltd. Tape recorder stop mechanism. 4,803,585, Cl. 360-96.300.
Cherukuri, Subraman R.; Faust, Steven M.; and Orlandi, Daniel A., to Warner-Lambert Company. Flavor and sweetness enhancement delivery systems and method of preparation. 4,803,082, Cl. 424-493.000.
Chevron Research Company: *See*—
Graebeer, Peter; Sie, Swan A.; and Angehrn, Jorg A., 4,803,479, Cl. 340-860.000.
Hsueh, Liming; and Reed, Marion G., 4,802,533, Cl. 166-252.000.
Laxo, Darryl E., 4,802,306, Cl. 49-31.000.
Wollenberg, Robert H.; and Plavac, Frank, 4,802,893, Cl. 252-49.600.
Wollenberg, Robert H., 4,803,002, Cl. 252-49.600.
Chianese, Richard B. G., to Westinghouse Electric Corp. Nonelectric temperature monitor. 4,802,772, Cl. 374-205.000.
Chiang, Long Y.; and Bloch, Aaron N., to Exxon Research and Engineering Company. Strongly magnetic organic solid state composition of matter. 4,803,006, Cl. 252-62.510.
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Chifflet, Raymond: *See*—
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Chiku, Kazuyoshi: *See*—
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Chilva, Timothy E., to Azdel, Inc. Method of preparing sheets of fiber reinforced thermoplastic resin or subsequent molding in a press. 4,802,843, Cl. 432-8.000.
Chinese Academy of Medical Sciences: *See*—
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Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Meszaros, Zoltan, deceased; Ritli, Peter; Sipos, Judit; and Pajor, Aniko , 4,803,274, Cl. 546-13.000.
Chiodo, Gary T. Syringe holder. 4,802,645, Cl. 248-309.100.
Cho, Boong Y., to Process Automation Business, Inc. Thickness measurement with automatic correction for changes in composition. 4,803,715, Cl. 378-90.000.
Cho, George, to Candela Laser Corporation. Rigid endoscope with flexible tip. 4,802,461, Cl. 128-7.000.
Choay, Jean: *See*—
Jacquinet, Jean-Claude; Petitou, Maurice; Sinay, Pierre; and Choay, Jean, 4,803,265, Cl. 536-123.000.
Choay, S.A.: *See*—
Jacquinet, Jean-Claude; Petitou, Maurice; Sinay, Pierre; and Choay, Jean, 4,803,265, Cl. 536-123.000.
Chohan, Satish M.; and Antosch, Jerry J., to Gates Rubber Company, The. Quick connect coupling. 4,802,696, Cl. 285-317.000.
Choi, Tai J., to Choi, Tai Jin; Kim, Jung Bai; Park, Young Sung; and Kim, Sai Hwan. Safety boat assembly. 4,802,435, Cl. 114-360.000.
Choi, Tai Jin: *See*—
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Chugai Denki Kogyo K.K.: *See*—
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Chugai Seiyaku Kabushiki Kaisha: *See*—
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Chung, David Y., to Exxon Chemical Patents Inc. Ethylene copolymer viscosity index improver dispersant additive useful in oil compositions. 4,803,003, Cl. 252-51.50A.
Ciba-Geigy AG: *See*—
Steiger, Rolf; and Schellenberg, Matthias, 4,803,151, Cl. 430-562.000.
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Brunner, Hans-Georg; and Muller, Urs, 4,803,268, Cl. 544-58.400.
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Cibles Descos S.A.R.L.: *See*—
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Ciolino, Laura A.; and Clancy, Shaun F., to Drackett Company, The. Cleaning composition containing a colorant stabilized against fading. 4,803,008, Cl. 252-162.000.
Citron, Howard: *See*—
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Clancy, Shaun F.: *See—*
Ciolino, Laura A.; and Clancy, Shaun F., 4,803,008, Cl. 252-162.000.

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Clark, Noel A.; Douglas, Kenneth; and Rothschild, Kenneth J., to Boston University, Trustees of; and University of Colorado Foundation, Inc. Method for parallel fabrication of nanometer scale multidevice structures. 4,802,951, Cl. 156-630.000.

Clarke, Stephen E.; Hendry, James D.; and Mijares, Ernest R., to Ford Aerospace Corporation. Telescoped ammunition round having subcaliber projectile sabot with integral piston. 4,802,415, Cl. 102-434.000.

Claxton, George P.: *See—*
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Clenet, Alain J-M: *See—*
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Cliffe, Ian A.: *See—*
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Clough, John; and Godfrey, Christopher R. A., to Imperial Chemical Industries PLC. Fungicidal alpha-substituted acrylates. 4,802,913, Cl. 71-111.000.

Coca-Cola Company, The: *See—*
Rudick, Arthur G.; Heenan, Richard H.; and Gupta, Ashis S., 4,802,343, Cl. 62-294.000.

Coccetti, Silvano: *See—*
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Cochran, Frederick; Davis, Jack; and Aprugese, John, to United States of America, Navy. Thermally buffered sodium-neon laser target for coherent x-ray production. 4,803,687, Cl. 372-5.000.

Cockerill Mechanical Industries: *See—*
Widart, Jean E., 4,802,273, Cl. 29-421.100.

Coe Manufacturing Company, The: *See—*
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Coe, Merlin D.: *See—*
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Cohen, Richard J.; and Smith, Joseph M., to Massachusetts Institute of Technology. Method and apparatus for assessing myocardial electrical stability. 4,802,491, Cl. 128-702.000.

Cohen, Robert K. Power control and line voltage monitor/compensator for resistance spot welding machines. 4,803,331, Cl. 219-110.000.

Cole, Rodney D. Material applicator assembly and wiper therefor. 4,802,797, Cl. 401-122.000.

Coleman, Daniel: *See—*
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Colgate-Palmolive Company: *See—*
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Collagen Corporation: *See—*
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Collier, Christopher J.: *See—*
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Collins, John A., Jr. Rapid mandibular advancement and vertical and lateral development device. 4,802,849, Cl. 433-19.000.

Collot, Patrice; and Luciani, Bernard, to Cibie Projecteurs. Motor vehicle headlight, suitable for emitting a beam limited by a cut-off, and including a modified rear portion. 4,803,601, Cl. 362-80.000.

Colorcon, Inc.: *See—*
Woznicki, Edward J.; and Grillo, Susan M., 4,802,924, Cl. 427-3.000.

Colt Industries Inc.: *See—*
Bauerle, David D.; and Rabotnick, Barry I., 4,802,902, Cl. 55-484.000.

Combourieu, Michel; Simbille, Nadine; Landes, Marie-Paule; and Bernet, Yvon, to RIOM Laboratories C.E.R.M. 1,3-propanediamine derivatives and antiauhythnic pharmaceutical composition containing them. 4,803,219, Cl. 514-469.000.

Commercial Shearing, Inc.: *See—*
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Commissariat a l'Energie Atomique: *See—*
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Henri, Antoine; Lefevre, Daniel; and Massicot, Patrick, 4,803,098, Cl. 427-309.000.

Compagnie Generale D'Automatisme CGA-HBS: *See—*
Allio, Roland; Chifflet, Raymond; and Jeantin, Phillipe, 4,802,665, Cl. 271-225.000.

Computervision Corporation: *See—*
Malmquist, Richard G., 4,803,306, Cl. 174-35.0GC.

Consolidated Controls Corporation: *See—*
Standke, Helmut, 4,802,621, Cl. 236-93.00R.

Consolidated Devices Inc.: *See—*
Grabovac, Bosko; and Kurtovic, Zlatko, 4,802,540, Cl. 177-211.000.

Contal, Maurice: *See—*
Fournier, Bernard; Contal, Maurice; and Vergez, Andre , 4,803,587, Cl. 361-24.000.

Cook, Robert V.: *See—*
Fox, Rodney T.; Cowen, Raymond A.; Pool, Hazel; and Cook, Robert V., 4,802,997, Cl. 252-8.600.

Cooper Industries, Inc.: *See—*
Bzdak, Richard J., 4,803,588, Cl. 361-118.000.

Corbett, William D., to Brunswick Corporation. Foam pattern for engine cylinder block. 4,802,447, Cl. 123-65.00K.

Cordan, Ernest W., Jr., to NCR Corporation. Nonvolatile electronic odometer with excess write cycle protection. 4,803,707, Cl. 377-24.100.

Cordell, James E. Leveler attachment for ladders. 4,802,471, Cl. 182-204.000.

Corder, Thomas E.; and Mullin, James B., to Intelock Corporation. Battery-powered door lock assembly and method. 4,802,353, Cl. 70-277.000.

Cordis Leads, Inc.: *See—*
Schroeppel, Edward A., 4,802,481, Cl. 128-419.0PG.

Corenman, James E.: *See—*
Goodman, David E.; and Corenman, James E., 4,802,486, Cl. 128-633.000.

Corrigan, Gerald E.: *See—*
Levine, Stephen N.; Puhl, Larry C.; Bliss, Harry M.; and Corrigan, Gerald E., 4,803,726, Cl. 380-48.000.

Cortellino, Charles A.: *See—*
Ahn, Kie Y.; Basavaiah, Saryadevara; Brodsky, Stephen B.; Cortellino, Charles A.; and Levine, Joseph E., 4,803,110, Cl. 428-137.000.

Costin, Dinu; and Citron, Howard, to Robotic Vision Systems, Inc. Passive positioning apparatus. 4,802,800, Cl. 409-131.000.

Coughlin, Paul R.: *See—*
Armijo, Richard L.; and Coughlin, Paul R., 4,802,587, Cl. 206-444.000.

Council of Scientific & Industrial Research: *See—*
Khan, Mirza M. T.; Bhardwaj, Ramesh C.; and Bhardwaj, Chhaya, 4,802,963, Cl. 204-157.500.

Counts, Richard: *See—*
Tabor, Jim; and Counts, Richard, 4,803,586, Cl. 361-18.000.

Courdille, Michel: *See—*
Steers, Michel; Courdille, Michel; and Hazan, Jean-Pierre, 4,803,342, Cl. 219-257.000.

Cowen, Raymond A.: *See—*
Fox, Rodney T.; Cowen, Raymond A.; Pool, Hazel; and Cook, Robert V., 4,802,997, Cl. 252-8.600.

Cox, Frederick E.: *See—*
Torossian, Kevork A.; Heisler, Ralph T.; and Cox, Frederick E., 4,803,028, Cl. 264-263.000.

Cox, George W.: *See—*
Bain, William L., Jr.; Bedichek, Robert C.; Cox, George W.; Grassl, Gerhard; Peterson, Craig B.; Rattner, Justin R.; Singh, Gurbir; Singh, Gurbir; and Wipfli, John L., 4,803,622, Cl. 364-200.000.

Coy, David H.; and Hocart, Simon J., to Administrators of the Tulane Educational Fund, The. Method for synthesizing a peptide containing a non-peptide. 4,803,261, Cl. 530-333.000.

Coyne & Delany Co.: *See—*
Laverty, Martin J., Jr., 4,802,246, Cl. 4-427.000.

Craig, Richard R.: *See—*
Pepper, David M.; and Craig, Richard R., 4,803,696, Cl. 372-95.000.

Crass, Guenther: *See—*
Peiffer, Herbert; Crass, Guenther; Dietz, Wolfgang; and Schloegl, Gunter, 4,803,027, Cl. 264-210.500.

Creedon, Richard L.: *See—*
Bhadra, Dilip K.; Creedon, Richard L.; Harder, C. Ross; and Bourque, Robert F., 4,802,560, Cl. 188-264.00F.

Criner, Cecil L.: *See—*
Muralidhara, Harapanahalli S.; and Criner, Cecil L., 4,802,964, Cl. 204-180.100.

Croat, John J., to General Motors Corporation. High energy product rare earth-iron magnet alloys. 4,802,931, Cl. 148-302.000.

Croft, James J.: *See—*
Carver, Robert W.; and Croft, James J., 4,803,733, Cl. 381-193.000.

Croll, Theodore P. Enamel-bonding etchant and procedure. 4,802,950, Cl. 156-629.000.

Crona, Theodore J.; Bichsel, Heinz; and Timm, Jurgen, to Swiss Aluminium Ltd. Substrate for a lithographic printing plate. 4,802,935, Cl. 148-437.000.

Crosfield Electronics Limited: *See—*
Kirk, Richard A., 4,803,548, Cl. 358-36.000.

Cross, Donald G.: *See—*
Hall, David R.; and Cross, Donald G., 4,802,539, Cl. 175-329.000.

Cross, Peter: *See—*
Scifres, Donald R.; Kung, Hsing; Cross, Peter; Burnham, Robert D.; and Streifer, William, 4,803,691, Cl. 372-150.000.

Crostack, Horst-Artur. Method and apparatus for non-destructive material testing, particularly for determination of thickness of coating layers on a base material by measuring electrical conductivity or magnetic permeability at the finished specimen. 4,803,428, Cl. 324-230.000.

Crystal, Richard G.: *See*—
Duff, James M.; Drappel, Stephan; Mayo, James D.; and Crystal, Richard G., 4,803,119, Cl. 428-321.300.

CTI Industries: *See*—
Davis, John C.; and Milne, James A., 4,802,877, Cl. 446-222.000.

Cummings, Michael A.: *See*—
Brockmeyer, Jerry W.; and Cummings, Michael A., 4,802,527, Cl. 164-358.000.

Cunningham, Paul E. Tethered flying disc with two-piece bearing means. 4,802,875, Cl. 446-46.000.

Curran, William V.: *See*—
Lee, Ving J.; and Curran, William V., 4,803,280, Cl. 548-127.000.

Curt G. Joa, Inc.: *See*—
Hirsch, John L.; and Wingender, Mark L., 4,802,570, Cl. 414-790.000.

Curtis, Daniel L., to Hughes Aircraft Company. Non-temperature cycling cryogenic cooler. 4,802,345, Cl. 62-514.00R.

Cutting, Lawrence R.: *See*—
Ameen, Joseph G.; Carden, Timothy F.; Cutting, Lawrence R.; Engle, Stephen R.; and Moore, Ronald J., 4,803,100, Cl. 427-387.000.

Czech, Erwin: *See*—
Ostertag, Werner; Czech, Erwin; Schmitt, Franz-Ulrich; and Schulze-Hagenest, Detlef, 4,803,143, Cl. 430-106.600.

Czechowski, Joseph, III: *See*—
Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.

Dage, Richard C.: *See*—
Jones, Winton D.; Schnettler, Richard A.; Claxton, George P.; and Dage, Richard C., 4,803,210, Cl. 514-293.000.

Dahlem, David F. Nozzle lock gas cap. 4,802,516, Cl. 141-392.000.

Daikoku, Kazuhiro; and Ogose, Shigeaki, to Nippon Telegraph and Telegraph Corporation. SSB communication system. 4,803,739, Cl. 455-47.000.

Dailey, George F.; and Morrison, Paul E., to Westinghouse Electric Corp. Rotor-in-stator examination magnetic carriage and positioning apparatus. 4,803,563, Cl. 358-100.000.

Daimler-Benz Aktiengesellschaft: *See*—
Ableitner, Erich, 4,802,448, Cl. 123-90.550.
Hoffmann, Friedrich; and Scheller, Franz X., 4,802,689, Cl. 280-688.000.
Resch, Reinhard, 4,802,712, Cl. 303-114.000.

Dain, Lester C.: *See*—
Efford, Thomas W.; and Dain, Lester C., 4,803,598, Cl. 361-541.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Onishi, Hiroyuki; Sano, Tetsuo; Hoki, Tetsuo; Kodama, Eiji; Tsujinaka, Hisayuki; and Kitakado, Ryuji, 4,803,734, Cl. 382-8.000.

D'Aleo, Michael J.: *See*—
Jacoby, Elliot G., Jr.; D'Aleo, Michael J.; Luchaco, David G.; Spira, Joel S.; Wagner, Richard A.; Yuhasz, Stephen J.; and Dowler, David H., 4,803,380, Cl. 307-157.000.

Dalton, Barbara J.; and Rees, Robert C., to SmithKline Beckman Corporation. Immunomodulation. 4,803,072, Cl. 424-85.50C.

DAMCO Plastics Corporation: *See*—
Denmark, Henry M., 4,802,443, Cl. 119-19.000.

Dammann, Laurence G., to Ashland Oil, Inc. Flexibilized phenol/mercapto resins and their synthesis. 4,803,245, Cl. 525-123.000.

Damon Biotech, Inc.: *See*—
Jarvis, Allan P., Jr., 4,803,168, Cl. 435-240.220.

Danel, Alexander R.: *See*—
Lohrey, David W.; and Danel, Alexander R., 4,803,348, Cl. 235-381.000.

Daniels, Duane D. Newspaper dispenser. 4,802,606, Cl. 221-39.000.

Daponte, Diego H., to Kimberly-Clark Corporation. Coformed ethylene-vinyl copolymer elastomeric fibrous webs. 4,803,117, Cl. 428-228.000.

Darr, Richard C., to Plastipak Packaging, Inc. Blow molded polyethylene terephthalate container having IML textured label wall and method for making same. 4,802,295, Cl. 40-310.000.

Dartnall, Adrian: *See*—
Pijanowski, Stefan; Thompson, Peter; and Dartnall, Adrian, 4,802,601, Cl. 220-4.00R.

Dashwood, Nigel J. R., to Duracell Inc. Rear lights for bicycles and other vehicles. 4,803,608, Cl. 362-72.000.

Dautel, Heinz; and Wesch, Johann G., to Alfred Karcher GmbH & Co. Rotor nozzle for a high-pressure cleaning device. 4,802,628, Cl. 239-227.000.

Davenport, Karen A.: *See*—
Fraenkel, Howard A.; Davenport, Karen A.; and Spicciati, Frank A., 4,803,097, Cl. 427-307.000.

Davis, Jack: *See*—
Cochran, Frederick; Davis, Jack; and Aprugese, John, 4,803,687, Cl. 372-5.000.

Davis, James A.: *See*—
Valaitis, Joseph K.; and Davis, James A., 4,803,020, Cl. 264-22.000.

Davis, James P.; and Henry, David W. Portable collapsible building system of modular construction. 4,802,500, Cl. 135-97.000.

Davis, John C.; and Milne, James A., to CTI Industries. Method and apparatus of tying the neck of a balloon. 4,802,877, Cl. 446-222.000.

Davis, Pauline D. Educational blocks. 4,802,854, Cl. 434-159.000.

Dawes, Ronald G.; Hilton, Geoffrey T.; Marshall, Anthony W.; and Bullivant, Derek, to British Telecommunications Public Limited Company. Heat sink. 4,802,532, Cl. 165-80.300.

Deambrosio, Carlos A., to Electrovert Limited. Restriction of dross formation in a soldering apparatus. 4,802,617, Cl. 228-180.100.

Debus, Jurgen, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Device for electrical connection of two components. 4,802,863, Cl. 439-387.000.

Decker, Heinz; Engfer, Ortwin; and Kuhle, Walter, to Robert Bosch GmbH. Adjustable engine mount. 4,802,648, Cl. 248-550.000.

Decko, Gary W.; Peng, Yao; and Vogel, Herman, to Avco Corporation. Stress relief support structures and assemblies. 4,802,823, Cl. 416-97.00A.

Dee Zee, Inc.: *See*—
Elwell, Dennis L., 4,802,705, Cl. 296-39.200.

Deere & Company: *See*—
Bennett, Robert E., 4,802,496, Cl. 130-27.00S.
Schwarz, Reinhard; Stuhrmann, Heinz; and Nobis, Dieter, 4,802,384, Cl. 74-745.000.

Deger, Hans-Matthias: *See*—
Thiem, Joachim; Deger, Hans-Matthias; Fritsche-Lang, Wolfram; and Kreuzer, Matthias, 4,803,263, Cl. 536-18.600.

Degnan, Thomas F.: *See*—
Chen, Nai Y.; Degnan, Thomas F.; and Weisz, Paul B., 4,803,186, Cl. 502-66.000.

Degott, Pierre: *See*—
Arnand, Michel; Fouletier, Mireille; and Degott, Pierre, 4,803,249, Cl. 525-326.200.

DeJonge, Antonia R. Container collar dosage time indicator and container. 4,802,438, Cl. 116-308.000.

Delta Elettronica s.r.l.: *See*—
Memmola, Serafino, 4,802,378, Cl. 74-502.600.

DeLuca, Michael J.; and Willard, David F., to Motorola, Inc. Apparatus and method for fine synchronization of a communication receiver. 4,803,703, Cl. 375-116.000.

Delves, Ronald F.: *See*—
Griffin, Dennis; and Delves, Ronald F., 4,802,400, Cl. 89-1.570.

DeMario, Edmund E.; and Street, Bobby D., to Westinghouse Electric Corp. Nuclear fuel rod grid spring and dimple structures. 4,803,043, Cl. 376-442.000.

Demetron Gesellschaft Fuer Elektronik-Werkstoffe m.b.H.: *See*—
Hausselt, Juergen; Schittny, Stephan-U.; and Kaufmann, Dieter, 4,803,046, Cl. 420-83.000.

Demjanenko, Victor: *See*—
Neil, James E.; Demjanenko, Victor; and Caile, Christopher R., 4,803,718, Cl. 379-163.000.

Denmark, Henry M., to DAMCO Plastics Corporation. Dome shaped animal shelter. 4,802,443, Cl. 119-19.000.

Denton, Peter R. Anti-relfection overlay device. 4,802,737, Cl. 350-166.000.

Deprez, Roland, to Marzet-Aubry. Traction device for operating tables and orthopaedic surgery apparatus for surgical operations. 4,802,464, Cl. 128-71.000.

Desalination Systems, Inc.: *See*—
Lien, Larry A., 4,802,982, Cl. 210-247.000.

Descos, Rene; and Laporte, Jean-Claude, to Cibles Descos S.A.R.L. Clay pigeon having at least one sealed recess containing a product producing a cloud permitting visualization in space of the impact and/or during flight. 4,802,676, Cl. 273-363.000.

Designs for Vision, Inc.: *See*—
Feinbloom, Richard E., 4,802,756, Cl. 351-200.000.

de Souza, Noel J.: *See*—
Dhar, Rajkumar; Venugopalan, Bindumadhavan; Chatterjee, Dipak K.; Rupp, Richard H.; and de Souza, Noel J., 4,803,204, Cl. 514-232.800.

Deutsch, Howard M.: *See*—
Haugwitz, Rudiger D.; Naratanan, Venkatachala; Zalkow, Leon H.; Deutsch, Howard M.; and Gelbaum, Leslie, 4,803,202, Cl. 514-228.200.

Deutsche ITT Industries GmbH: *See*—
Giebel, Burkhard; and Theus, Ulrich, 4,803,657, Cl. 365-221.000.
Mehrgardt, Soenke, 4,803,407, Cl. 315-364.000.

Deutsche Thomson-Brandt GmbH: *See*—
Baas, Dieter, 4,803,676, Cl. 369-143.000.
Uhde, Dietmar; Gleim, Gunter; Schandl, Hartmut; Hoch, Peter; and Lehmann, Rudiger, 4,803,408, Cl. 318-254.000.

DeWald, Horace A.: *See*—
Caprathe, Bradley W.; DeWald, Horace A.; Jaen, Juan C.; and Wise, Lawrence D., 4,803,203, Cl. 514-230.500.

Dewert, Heribert: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,802,573, Cl. 201-39.000.

Dewey, Richard J.; and Collier, Christopher J., to U.S. Philips Corp. Method of, and demodulator for, digitally demodulating an SSB signal. 4,803,700, Cl. 375-77.000.

de Wit, Michiel: *See*—
Hester, Richard K.; and de Wit, Michiel, 4,803,462, Cl. 341-172.000.

Dhar, Rajkumar; Venugopalan, Bindumadhavan; Chatterjee, Dipak K.; Rupp, Richard H.; and de Souza, Noel J., to Hoechst Aktiengesellschaft. 1-substituted 3-aryl-7-chloro-3,4-dihydro(2H)-acridone N-oxides, a process for their preparation, and their use as medicaments and feedstuff additives. 4,803,204, Cl. 514-232.800.

Diaz, Carlos M.: *See*—
Victorovich, Grigori S.; Diaz, Carlos M.; O'Neill, Charles E.; Bell, James A. E.; and Timberg, Lloyd M., 4,802,916, Cl. 75-24.000.
Victorovich, Grigori S.; Diaz, Carlos M.; and O'Neill, Charles E., 4,802,917, Cl. 75-26.000.
Dickerson, Robert E.; Kelly, James E.; Diehl, Donald R.; and Factor, Ronda E., to Eastman Kodak Company. Radiographic element exhibiting reduced crossover. 4,803,150, Cl. 430-502.000.
Dickey-john Corporation: *See*—
Bachman, Wesley J.; and Stone, Steven G., 4,803,626, Cl. 364-424.070.
Dickson, Edwin J., to Babcock & Wilcox Company, The. High temperature fiber system with controlled shrinkage and stress resistance. 4,802,425, Cl. 110-336.000.
Dicon Systems Limited: *See*—
Taylor, Stephen C., 4,803,473, Cl. 340-693.000.
Didier-Werke AG: *See*—
Schuhmacher, Otto, 4,802,611, Cl. 222-600.000.
Diehl, Conrad; and DiRisio, Anthony, to Eastman Kodak Company. Electromagnetic control device for cameras. 4,803,506, Cl. 354-400.000.
Diehl, Donald R.: *See*—
Dickerson, Robert E.; Kelly, James E.; Diehl, Donald R.; and Factor, Ronda E., 4,803,150, Cl. 430-502.000.
Diehl GmbH & Co.: *See*—
Fiedler, Kurt; and Kratz, Bernhard, 4,802,414, Cl. 102-206.000.
Diehl, Werner K.; Fieseler, Heinrich; and SaBmann, Gerhard, to Messer Griesheim GmbH. Closing for a discharge-proof cryocontainer. 4,802,598, Cl. 215-348.000.
Dierckx, Rudolf F. I.; Sallaerts, Daniel; and Guebels, Pierre-Paul F., to Alcatel N.V. Echo canceller using an adaptive finite impulse response filter. 4,803,648, Cl. 364-724.190.
Diesel Kiki Co., Ltd.: *See*—
Nakajima, Nobuyuki, 4,802,830, Cl. 418-150.000.
Takahashi, Masaatsu, 4,802,451, Cl. 123-373.000.
Dieter Grasslin Feinwerktechnik: *See*—
Remigio, Ros; and Achim, Storz, 4,803,379, Cl. 307-112.000.
Dieterich, Charles B., to RCA Licensing Corporation. Sampled data audio tone control apparatus. 4,803,647, Cl. 364-724.170.
Dietrich, Manfred; Pedain, Josef; Konig, Klaus; and Hohlein, Peter, to Bayer Aktiengesellschaft. Process for the preparation of polymers containing hydroxyl groups and their use for the production of polyurethanes. 4,803,246, Cl. 525-124.000.
Dietz, Wolfgang: *See*—
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Dillon, Harvey A. Hearing aid amplification method and apparatus. 4,803,732, Cl. 381-68.200.
Director-General of the Agency of Industrial Science and Technology: *See*—
Hibino, Junichi; and Ando, Eiji, 4,803,287, Cl. 549-252.000.
DiRisio, Anthony: *See*—
Diehl, Conrad; and DiRisio, Anthony, 4,803,506, Cl. 354-400.000.
Dirkin, William; Peters, Fred; and Benton, Terry L., to Pneumo Abex Corporation. Composite cylinder assembly with removable liner assembly. 4,802,404, Cl. 92-171.000.
Dittmer, Howard R.: *See*—
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Dixon, John; and Ince, Francis, to Fisons, plc. Dihydroxy-phenethylamino compounds useful as pharmaceuticals. 4,803,225, Cl. 514-654.000.
Dixon, John: *See*—
Appleton, Richard A.; Dixon, John; and Burford, Sidney C., 4,803,216, Cl. 514-407.000.
DMV-Campina B.V.: *See*—
Kussendrager, Klaas D.; van den Biggelaar, Henricus A. M.; and Vromans, Herman, 4,802,926, Cl. 127-31.000.
Dockner, Toni; Kempe, Uwe; and Koehler, Hermann, to BASF Aktiengesellschaft. Preparation of 4(5)-nitroimidazole-5(4)-carboxylic acids. 4,803,283, Cl. 548-339.000.
Dr.-Ing. Rudolf Hell GmbH: *See*—
Kennedy, John A., Jr.; and Hansen, Walter, 4,803,497, Cl. 346-108.000.
Doddi, Namassivaya: *See*—
Dunks, Gary B.; Yamada, Akira; Doddi, Namassivaya; and Beard, Charles D., 4,803,254, Cl. 525-477.000.
Doi, Hajime; Akai, Norio; and Matsumoto, Fujio, to Hitachi Maxell, Ltd. Disk cartridge with cleaning sheet of non-woven fabric. 4,803,584, Cl. 360-133.000.
Doi, Hiroyuki: *See*—
Usami, Kenichi; Kirihara, Seishin; Morimoto, Tadaoki; Doi, Hiroyuki; and Okada, Michiya, 4,802,894, Cl. 48-77.000.
Doi, Shunichi: *See*—
Yasuike, Osamu; Arai, Yasuji; Ikemoto, Hiroyuki; Owa, Nobutaka; and Doi, Shunichi, 4,803,627, Cl. 364-424.050.
Doleschel, Walter; Doleschel, Walter N.; and Kaltschmid, Helmut, to Schwab & Co Ges.m.b.H. Process for the pasteurization of plasma proteins and plasma protein fractions. 4,803,073, Cl. 424-101.000.
Doleschel, Walter N.: *See*—
Doleschel, Walter; Doleschel, Walter N.; and Kaltschmid, Helmut, 4,803,073, Cl. 424-101.000.
Doll, Ronald J.: *See*—
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Domagala, John M.: *See*—
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Dombrowski, Anthony E., to Sommers, Steven F.; Schreiner, Bruce E.; Land Paving Company; Omni Holding Company; Ronk, Jerry; and Wichser, Robert. Driver alerting device. 4,803,488, Cl. 340-904.000.
Donatsch, Peter; Engel, Gunter; Hugi, Bruno; Richardson, Brian P.; Stadler, Paul A., deceased; by Stadler, Hildegard R., heir; by Stadler, Brigitte M., heir; by Stadler, Sigrid A., heir; and by Breuleux, Gerald, legal representative. Pharmaceutically useful heterocyclic and carbocyclic acid esters and amides of alkylene bridged piperidines. 4,803,199, Cl. 514-214.000.
Donomoto, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Method for making composite material using oxygen. 4,802,524, Cl. 164-97.000.
Dornhagen, Horst; Hammer, Hartmut; and Meisenburg, Ewald. Process for the purification of dimethylether by distillation. 4,802,956, Cl. 203-42.000.
Dornier Medizintechnik GmbH: *See*—
Heine, Gerold; and Stark, Joachim, 4,802,525, Cl. 164-48.000.
Doty, Gerald A.; and Zygutis, James L., to Gateway Industries, Inc. Seat belt buckle. 4,802,266, Cl. 24-637.000.
Douglas, Kenneth: *See*—
Clark, Noel A.; Douglas, Kenneth; and Rothschild, Kenneth J., 4,802,951, Cl. 156-630.000.
Dove, Dan: *See*—
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Dow Chemical Company, The: *See*—
Cheek, Gary C.; and Rice, Andy, 4,802,610, Cl. 222-481.500.
Eisman, Glenn A.; and Alexander, Lloyd E., 4,802,960, Cl. 204-98.000.
Dow Corning Corporation: *See*—
Luckenbach, Roy, 4,803,256, Cl. 525-420.000.
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Dowell Schlumberger Incorporated: *See*—
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Dowler, David H.: *See*—
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Doyle, Arthur F.: *See*—
Sklarski, Dennis J.; and Doyle, Arthur F., 4,803,113, Cl. 428-182.000.
Doyle, Terrence W.: *See*—
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Drackett Company, The: *See*—
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Dragon Systems, Inc.: *See*—
Baker, James K., 4,803,729, Cl. 381-43.000.
Drappel, Stephan: *See*—
Duff, James M.; Drappel, Stephan; Mayo, James D.; and Crystal, Richard G., 4,803,119, Cl. 428-321.300.
Du Pont Canada Inc.: *See*—
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Zboril, Vaclav G.; and Mitchell, David J., 4,803,259, Cl. 528-483.000.
Dubach, Werner F., to Alfatechnic AG. Plastic stopper for a container, with a measuring cup that serves as a cap. 4,802,597, Cl. 215-307.000.
Duff, James M.; Drappel, Stephan; Mayo, James D.; and Crystal, Richard G., to Xerox Corporation. Ink compositions for impact typewriter ribbons. 4,803,119, Cl. 428-321.300.
Dumas, Donald J., to Du Pont de Nemours, E. I., and Company. Herbicidal ortho-sulfonamide benzenesulfonylureas. 4,802,906, Cl. 71-92.000.
Duncan, William, to Motorola Inc. Method of packaging. 4,802,325, Cl. 53-444.000.
Dunks, Gary B.; Yamada, Akira; Doddi, Namassivaya; and Beard, Charles D., to Iolab Corporation. Vinylsilylalkoxy arylbenzotriazole compounds and UV absorbing compositions made therefrom. 4,803,254, Cl. 525-477.000.
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Robertson, Archibald S., Jr., 4,802,445, Cl. 122-4.00D.

Fouletier, Mireille: *See*—
Armand, Michel; Fouletier, Mireille; and Degott, Pierre, 4,803,249, Cl. 525-326.200.

Fourie, Eugene; and Rumsey, Steven C., to American Standard Inc. Hydropneumatic brake actuator arranged to maintain a constant brake shoe clearancecu4,802,559, Cl. 188-196.00A.

Fournier, Bernard; Contal, Maurice; and Vergez, Andre , to La Telemecanique Electrique. Arrangement for change-over contact apparatus protection with interlocking member and modulecu4,803,587, Cl. 361-24.000.

Fox, Eugene N.: *See*—
Smith, Robert E.; and Fox, Eugene N., 4,803,162, Cl. 435-36.000.

Fox, Rodney T.; Cowen, Raymond A.; Pool, Hazel; and Cook, Robert V., to Reckitt & Colman Products Limited. Method for the treatment of textile surfaces and compositions for use thereincu4,802,997, Cl. 252-8.600.

Fraenkel, Howard A.; Davenport, Karen A.; and Spicciati, Frank A., to Allied-Signal Inc. Metal plating of plastic materialscu4,803,097, Cl. 427-307.000.

Fraize, Claude R.; Forja, Christian; and Calevo, Robert, to Societe Anonyme de Telecommunications; and Societe Industrielle de Liaisons Electriques. Reserve device for optical fiberscu4,802,724, Cl. 350-96.200.

Framatome: *See*—
Sevelinge, Gerard, 4,802,806, Cl. 411-383.000.

Francese, Catherine; Tordeux, Marc; and Wakselman, Claude, to Rhone-Poulenc Chimie. Process for the preparation of perfluoroalkyl ketonescu4,803,298, Cl. 860-174.000.

Frankel, Arthur E.: *See*—
Linaley, Peter S.; Ochs, Vincent W.; Horn, Diane; Brown, Joseph P.; Ring, David B.; and Frankel, Arthur E., 4,803,169, Cl. 435-7.000.

Frankel, Maurice: *See*—
Bachlelder, Walter F.; Frankel, Maurice; and Fiore, Peter, 4,802,366, Cl. 73-799.000.

Frankl & Kirchner GmbH & Co. KG: *See*—
Olbrich, Bernd, 4,803,411, Cl. 318-564.000.

Frazer-Nash Limited: *See*—
Griffin, Dennis; and Delves, Ronald F., 4,802,400, Cl. 89-1.570.

Frazier, James F.; Otto, Oberdan W.; and Pasiecznik, John, Jr., to Hughes Aircraft Company. Alignment mark detector for electron beam lithographycu4,803,644, Cl. 364-559.000.

Frei, Matthias; Mueller, Willi; and Sutter, Werner, to Elpatronic AG. Resistance seam welding machinecu4,803,325, Cl. 219-64.000.

Preluche, Jean-Pierre, to Saft, S.A. Method of manufacturing an electrochemical cell having an alkaline electrolyte and spiral-wound electrodescu4,802,275, Cl. 29-623.400.

French, Kendrick L., to K. W. Thompson Tool Company, Inc. Bullet lubricating apparatuscu4,802,297, Cl. 42-90.000.

Frensley, William R.: *See*—
Lewis, Adam J.; and Frensley, William R., 4,803,537, Cl. 357-30.000.

Frenzel, Jurgen: *See*—
Fasterding, Gunter; and Frenzel, Jurgen, 4,802,623, Cl. 238-44.000.

Frew, Larry H.; and Fuller, Melvin L., to Utility Systems Corporation. Intelligent utility meter systemcu4,803,632, Cl. 364-464.040.

Frey, Jonathan P.: *See*—
Schlipalius, Lance E.; Myers, Jeffrey J.; and Frey, Jonathan P., 4,803,090, Cl. 426-242.000.

Frick, Richard H.; Kons, Hugo L.; and Morris, Marion C., to Kimberly-Clark Corporation. Method and apparatus for level winding elastomeric ribboncu4,802,636, Cl. 242-67.10R.

Fried. Krupp GmbH: *See*—
Friedrich, Ronald; Hammecke, Werner, deceased; and Friedrich, Ronald, 4,802,526, Cl. 164-287.000.

Friedman, Ernest H.; Sanders, Gary G.; and Hunter, Steven L., to Friedman, Ernest H. Method and apparatus to monitor asymmetric and interhemispheric brain functionscu4,802,484, Cl. 128-630.000.

Friedrich, Ronald; Hammecke, Werner, deceased (by Hammecke, Marie Elise Gisela, heiress); and Friedrich, Ronald, to Fried. Krupp GmbH. Centrifugal castercu4,802,526, Cl. 164-287.000.

Friedrich, Ronald: *See*—
Friedrich, Ronald; Hammecke, Werner, deceased; and Friedrich, Ronald, 4,802,526, Cl. 164-287.000.

Frito-Lay, Inc.: *See*—
Shine, Ward, 4,803,084, Cl. 426-20.000.

Fritsche-Lang, Wolfram: *See*—
Thiem, Joachim; Deger, Hans-Matthias; Fritsche-Lang, Wolfram; and Kreuzer, Matthias, 4,803,263, Cl. 536-18.600.

Froidh, Arne; and Persson, Lennart, to Molnlycke AB. Method of folding into packages disposable absorbent articles, e.g. diapers, in connection with the production thereofcu4,802,884, Cl. 493-339.000.

Fryburg, George A.: *See*—
Makar, Francis B., Jr.; and Fryburg, George A., 4,803,403, Cl. 313-624.000.

Fu, Ping W.; and Manning, Thomas J., to Buddy Systems, Inc. Personal health monitorcu4,803,625, Cl. 364-413.030.

Fuchizawa, Tetsuro: *See*—
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,803,191, Cl. 503-200.000.

Fuchs, Volker, to Siemens Aktiengesellschaft. Coaxial collet chuckcu4,802,680, Cl. 279-33.000.

Fuel Tech, Inc.: *See*—
Sullivan, James C.; and Epperly, William R., 4,803,059, Cl. 423-235.000.

Fuji Electric Co., Ltd.: *See*—
Takahashi, Fumito, 4,803,444, Cl. 331-65.000.

Fuji Kogyo Co., Ltd.: *See*—
Ohmura, Ryuichi, 4,802,299, Cl. 43-22.000.

Fuji Photo Film Co., Ltd.: *See*—
Harada, Toru; and Sato, Kozo, 4,803,148, Cl. 430-138.000.
Horikawa, Kazuo, 4,803,409, Cl. 318-310.000.
Hosoi, Noriyuki, 4,803,144, Cl. 430-106.600.
Hosoi, Yuichi; and Miyahara, Junji, 4,803,359, Cl. 250-327.200.
Inoue, Noriyuki; Idota, Yoshio; and Yagihara, Morio, 4,803,146, Cl. 430-248.000.
Kubota, Jun, 4,803,561, Cl. 358-285.000.
Minoura, Nobuo; Nakadai, Katsuo; Harase, Toshikatsu; and Iwamatsu, Satoshi, 4,803,573, Cl. 360-78.130.
Miyake, Izumi; Kaneko, Kiyotaka; and Oda, Kazuya, 4,803,568, Cl. 360-33.100.
Momoki, Yasuhito; and Hasebe, Kazunori, 4,803,152, Cl. 430-567.000.
Murase, Masakazu; and Ishizaka, Hideo, 4,803,367, Cl. 250-236.000.
Murayama, Jin; Miida, Takashi; and Kondo, Ryuji, 4,803,706, Cl. 377-63.000.
Ogawa, Hiroshi; Mizuno, Chiaki; and Tamai, Yasuo, 4,803,120, Cl. 428-323.000.
Ryoke, Katsumi; Takahashi, Masatoshi; Okutu, Toshimitu; and Kosha, Hideaki, 4,803,121, Cl. 428-329.000.
Saeki, Keiso; Takashima, Masanobu; and Iwakura, Ken, 4,803,192, Cl. 503-212.000.
Seto, Kimio; and Ohgoda, Makoto, 4,802,618, Cl. 229-68.00R.
Suzuki, Tamotsu; Shinozaki, Fumiaki; Nishioka, Akira; and Totsuka, Mikio, 4,803,145, Cl. 430-166.000.
Takahashi, Toshiro; Kuwabara, Ken-ichi; and Okada, Masahiro, 4,803,149, Cl. 430-264.000.
Takayama, Naoto; Tsunekawa, Yuzo; and Kitamura, Kazumi, 4,802,554, Cl. 184-14.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,803,191, Cl. 503-200.000.

Fuji Xerox Co., Ltd.: *See*—
Teshigawara, Toru; Terao, Kazuo; and Watanabe, Hiroshi, 4,803,565, Cl. 358-300.000.

Fujii, Haruyuki: *See*—
Fujii, Toshitaka; and Fujii, Haruyuki, 4,802,300, Cl. 43-43.160.

Fujii, Kiyoshi, to NEC Corporation. X-ray lighography system using synchrotron radiationcu4,803,713, Cl. 378-34.000.

Fujii, Masanobu; and Tsuda, Tatsuya, to Sharp Kabushiki Kaisha. Microwave heating and infrared ray heating appliancecu4,803,324, Cl. 219-10.55F.

Fujii, Masashi: *See*—
Tsujii, Osamu; and Fujii, Masashi, 4,803,711, Cl. 378-4.000.

Fujii, Minoru: *See*—
Motoki, Hideo, 4,802,921, Cl. 106-18.120.

Fujii, Toshitaka; and Fujii, Haruyuki. Fishing hookcu4,802,300, Cl. 43-43.160.

Fujii, Yoshimasa: *See*—
Yamamoto, Masanori; Kamoda, Tamotsu; Nakahara, Makoto; Fujii, Yoshimasa; and Sugano, Shozo, 4,803,088, Cl. 426-107.000.

Fujimori Kogyo Co., Ltd.: *See*—
Ichikawa, Rinjiro; and Ishida, Toshio, 4,802,742, Cl. 350-339.00R.

Fujimoto, Teruo; Shiono, Mikio; Watanabe, Osamu; and Ito, Koichi, to Shin-Etsu Chemical Co., Ltd. Block-graft copolymercu4,803,243, Cl. 525-100.000.

Fujimura, Shoji; and Kawai, Toru, to Shikibo Ltd. Master pattern for upper garmentacu4,802,282, Cl. 33-12.000.

Fujioka, Toshiyuki; Kusunoki, Masahiro; and Osafune, Koji, to Kabushiki Kaisha Toshiba. Floppy disc magnetic head apparatus compatible with both horizontal and perpendicular recording mediacu4,803,571, Cl. 360-63.000.

Fujisawa, Katsuhide; Takanaka, Toshimasa; Buseki, Hiroo; and Takahashi, Masakatsu, to Nippon Reinz Co., Ltd. Joint means having flangescu4,802,698, Cl. 285-363.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Yoshida, Masaru; and Horikoshi, Koki, 4,803,074, Cl. 424-122.000.

Fujita, Hisao, to Konishiroku Photo Industry Co., Ltd. Scanning optical systemcu4,802,721, Cl. 350-6.800.

Fujita, Masafumi: *See*—
Saijo, Takao; and Fujita, Masafumi, 4,803,505, Cl. 354-80.000.

Fujitsu Limited: *See*—
Hayashi, Kazutoshi; Nabetani, Hideo; Tanaka, Toshiaki; and Ishida, Kazushi, 4,803,316, Cl. 200-406.000.
Hirochi, Katsuji, 4,803,383, Cl. 307-456.000.
Kasa, Yasushi, 4,803,665, Cl. 365-230.000.
Sugimoto, Masahiro; and Wakasugi, Yasumasa, 4,803,546, Cl. 357-81.000.
Takemae, Yoshihiro, 4,803,656, Cl. 365-200.000.
Yamane, Kazuo; Mori, Masakazu; Tsuda, Takashi; Ohkuma, Yo- shinori; and Suzuki, Kazuhiro, 4,803,384, Cl. 307-490.000.

Fujitus Limited: *See*—
Taguchi, Masao, 4,803,535, Cl. 357-23.600.

Fujiwara, Hideo; Sakemoto, Akito; and Inagoya, Osamu, to Hitachi Maxell, Ltd. Assembly for stably mounting magnetic head on carriagecu4,803,578, Cl. 360-105.000.

Fujiwara, Hiroshi: *See*—
Togino, Takayoshi; Fujiwara, Hiroshi; Takabayashi, Yutaka; Nagano, Takashi; Fukaya, Takashi; Minami, Kazuyuki; and Tsunoda, Toshiyuki, 4,802,749, Cl. 350-516.000.

Fujiwara, Takayoshi; Iida, Toshikatsu; and Fukuda, Tetuo, to Kabushiki Kaisha Toshiba. Compressorcu4,802,827, Cl. 417-356.000.

Fukada, Hideaki: *See*—
Masuda, Yoshio, 4,802,292, Cl. 37-69.000.

Fukase, Hiroshi: *See*—
Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, 4,803,303, Cl. 564-462.000.

Fukatsu, Tsutomu: *See*—
Kashida, Motokazu; Masui, Toshiyuki; Fukatsu, Tsutomu; Takahashi, Koji; Takei, Masahiro; and Nagasawa, Kenichi, 4,803,570, Cl. 360-61.000.

Fukaya, Takashi: *See*—
Togino, Takayoshi; Fujiwara, Hiroshi; Takabayashi, Yutaka; Nagano, Takashi; Fukaya, Takashi; Minami, Kazuyuki; and Tsunoda, Toshiyuki, 4,802,749, Cl. 350-516.000.

Fukuda, Akira; and Masuda, Itsuro, to Hamada Printing Press Mfg. Co., Ltd. Method and apparatus for treating end portion of roll papercu4,802,632, Cl. 242-58.500.

Fukuda, Kazumasa: *See*—
Ezaki, Joichiro; and Fukuda, Kazumasa, 4,803,577, Cl. 360-102.000.

Fukuda, Morio; Hanada, Masayuki; Inutsuka, Hideo; and Ogata, Katsuya, to Catalysts & Chemicals Industries Co., Ltd.; and Iwao Jiki Kogyo Co., Ltd. Die for molding honeycomb structurescu4,802,840, Cl. 425-464.000.

Fukuda, Tetuo: *See*—
Fujiwara, Takayoshi; Iida, Toshikatsu; and Fukuda, Tetuo, 4,802,827, Cl. 417-356.000.

Fukuhara, Satoru: *See*—
Shinada, Hiroyuki; Todokoro, Hideo; and Fukuhara, Satoru, 4,803,430, Cl. 324-250.000.

Fukuma, Masumi; and Akasaka, Nobuhiro, to Sumitomo Electric Industries, Ltd. Optical fiber cable preventing water from spreading toward cable interiorcu4,802,732, Cl. 350-96.230.

Fukumoto, Hiroshi: *See*—
Takagi, Seiichi; and Fukumoto, Hiroshi, 4,803,142, Cl. 430-106.600.

Fukushima, Shinichi: *See*—
Kashiwaya, Kunio; Haga, Hiroyo; Saeki, Nobuo; Yabuki, Youichi; Ozoe, Kuniyuki; Fukushima, Shinichi; and Tabata, Kazufumi, 4,802,270, Cl. 29-241.000.

Fuller, Melvin L.: *See*—
Frew, Larry H.; and Fuller, Melvin L., 4,803,632, Cl. 364-464.040.

Funabashi, Takanori; Nakada, Akiyoshi; and Tada, Haruo, to Matsushita Electric Industrial Co., Ltd. Industrial robotcu4,802,815, Cl. 414-680.000.

Furihata, Makoto: *See*—
Nishiyama, Tamotsu; Watanabe, Toshinori; Horie, Noboru; Furihata, Makoto; Kominami, Yasuo; and Mori, Fumihiko, 4,803,636, Cl. 364-491.000.

Furujo, Akira: *See*—
Nakano, Etsuo; Furujo, Akira; and Iizuka, Tetsuya, 4,803,405, Cl. 315-111.210.

Furukawa Construction Co., Ltd., The: *See*—
Sotani, Junji; Koizumi, Tatsuya; Endo, Shiro; Mashino, Nobuyoshi; and Seo, Susumu, 4,803,343, Cl. 219-326.000.

Furuya, Toshihiro: *See*—
Kato, Makoto; Homma, Koichi; Komura, Fuminobu; and Furuya, Toshihiro, 4,803,358, Cl. 250-310.000.

Fushiki, Yasuo; Isshiki, Minoru; Nakano, Hiroshi; Oizumi, Masayuki; Shimomura, Masayoshi; and Imajo, Keiji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Glass fiber-reinforced electrical laminates and a continuous production method thereforcu4,803,115, Cl. 428-285.000.

Futaba Corporation: *See*—
Teshigawara, Toru; Terao, Kazuo; and Watanabe, Hiroshi, 4,803,565, Cl. 358-300.000.

G. D. Searle & Co.: *See*—
Mueller, Richard A.; and Partis, Richard A., 4,803,294, Cl. 560-54.000.

G.D. Societa per Azioni: *See*—
Gamberini, Antonio; and Boriani, Silvano, 4,802,394, Cl. 83-346.000.

Gaalema, Steve D.; and Augustine, Frank L., to Hughes Aircraft Company. Infrared detector with integral feedback capacitancecu4,803,363, Cl. 250-338.400.

Gabbay, Shlomo. Sternum closure devicecu4,802,477, Cl. 128-317.000.

Gabel, Jean P., to Manufacture des Outils Dumont S.A. Tweezers with automatic opening and closingcu4,802,703, Cl. 294-99.200.

Gaillard, Jacques: *See*—
Bernard, Georges; Bouvet, Bernard; Jacolin, Richard; Colleoni, Guido; Gaillard, Jacques; and Volsy, Robert, 4,803,319, Cl. 200-147.00A.

Gajjar, Bahrat J., to Du Pont de Nemours, E. I., and Company. Method of warp knittingcu4,802,346, Cl. 66-195.000.

Galian, Boris A.: *See*—
Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; and Zelensky, Vladimir F., 4,803,330, Cl. 219-97.000.

Galkowski, Jan T., to International Business Machines Corporation. Method for encoding and decoding acyclic, linked-list data structures for efficient storage, retrieval and searchingcu4,803,651, Cl. 364-900.000.

Gamberini, Antonio; and Boriani, Silvano, to G.D. Societa per Azioni. Notching device for strip wrapping materialcu4,802,394, Cl. 83-346.000.

Ganter, Wolfgang: *See*—
Holzschuh, Wolfgang; and Ganter, Wolfgang, 4,803,544, Cl. 357-72.000.

Gao Gessellschaft fur Automation und Organisation mbH: *See*—
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,803,542, Cl. 357-72.000.

Garber, Frank R. Corrosion inhibitor for salt-based deicing compositionscu4,803,007, Cl. 252-70.000.

Gardiner, Roy J. W., to Sports Bio-Mechanics Research Inc. Measurement of the neutral alignment position of the footcu4,802,494, Cl. 128-779.000.

Gardner, Keith; Longman, Robert J.; Pettigrew, Robert M.; and Welford, Walter T., to Plasmon Data Systems, N.V. Interferometerscu4,802,736, Cl. 350-163.000.

Garnett, Donald W., to Olofsson Corporation, The. Apparatus providing environmental and mechanical protection for ball screw drivescu4,802,558, Cl. 188-134.000.

Garoutte, Kurt F., to Honeywell Inc. Pressure Activated reserve batterycu4,803,135, Cl. 429-116.000.

Garris, Charles R.; Ruttenberg, Kenneth M.; and Neiswender, James L., Sr., to SmithKline Beckman Corporation. Automated inspection of capsule sealscu4,802,323, Cl. 53-53.000.

Gas Research Institute: *See*—
Kuhn, Timothy J.; Bender, James W.; and Thekdi, Arvind C., 4,802,844, Cl. 432-126.000.
McFadden, David H.; and Lee, W. David, 4,802,459, Cl. 126-41.00R.

Gastebois, Philippe M. D.; and Imbault, Jean-Francois R., to Societe Nationale d'Etude et Moteurs d'Aviation "S.N.E.C.M.A." . Turbine rotorcu4,802,824, Cl. 416-193.00A.

Gaston, Lynn S., to Boeing Vertol Company; and Bell Helicopter Textron Inc., a part interest. Self-aligning electrical connectorcu4,802,861, Cl. 439-247.000.

Gates Rubber Company, The: *See*—
Chohan, Satish M.; and Antosch, Jerry J., 4,802,696, Cl. 285-317.000.

Gateway Industries, Inc.: *See*—
Doty, Gerald A.; and Zygutis, James L., 4,802,266, Cl. 24-637.000.

Gauffreau, George L.: *See*—
Chang, Mike F.; Yilmaz, Hamza; Gauffreau, George L.; and Owyang, King, 4,803,533, Cl. 357-23.400.

Gehring, Reinhold: *See*—
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,803,215, Cl. 514-407.000.

Gehrke, Russell P.: *See*—
Raniere, Jean E.; Smith, Steven L.; Gehrke, Russell P.; and Johnson, Richard E., Jr., 4,803,102, Cl. 428-35.200.

Geisthoff, Hubert, to Jean Walterscheid GmbH. Overload coupling for protecting drive trains especially on agricultural machinescu4,802,326, Cl. 56-10.300.

Geittner, Peter E. E.: *See*—
Bachmann, Peter K.; Geittner, Peter E. E.; Loers, Dieter; and Wilson, Howard J. C., 4,802,733, Cl. 350-96.340.

Gelbaum, Leslie: *See*—
Haugwitz, Rudiger D.; Naratanan, Venkatachala; Zalkow, Leon H.; Deutsch, Howard M.; and Gelbaum, Leslie, 4,803,202, Cl. 514-228.200.

Gemignani, Andre; Boulogne, Serge J.; and Schaumburg, Gerald, to Societe D'Exploitation de Brevets pour L'Industrie et la Marine. Fluid control valvecu4,802,505, Cl. 137-492.000.

Genedyne Corp.: *See*—
Abrahams, Sidney, 4,803,391, Cl. 310-178.000.
Genentech, Inc.: *See*—
Hitzeman, Ronald A.; Levinson, Arthur D.; and Yansura, Daniel G., 4,803,164, Cl. 435-68.000.
General Atomics: *See*—
Bhadra, Dilip K.; Creedon, Richard L.; Harder, C. Ross; and Bourque, Robert F., 4,802,560, Cl. 188-264.00F.
General Datacomm Industries, Inc.: *See*—
Rasberry, Joseph D.; and Nitschke, Karl D., 4,803,654, Cl. 364-900.000.
General Dynamics, Pomona Division: *See*—
Ignatowski, John J., 4,803,422, Cl. 324-73.00R.
General Electric Company: *See*—
Anderson, John M., 4,803,404, Cl. 313-634.000.
Benesch, Jay F., 4,803,456, Cl. 338-32.00S.
Burgess, James F.; Glascock, Homer H., II; Webster, Harold F.; Neugebauer, Constantine A.; and Loughran, James A., 4,803,450, Cl. 333-238.000.
Chang, Mike F.; Yilmaz, Hamza; Gauffreau, George L.; and Owyang, King, 4,803,533, Cl. 357-23.400.
Elabd, Hammam, 4,803,710, Cl. 377-60.000.
Kreage, James S.; and Zaka, Gordon E., 4,803,436, Cl. 324-549.000.
Pankove, Jacques I., 4,803,528, Cl. 357-23.100.
Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.
Torossian, Kevork A.; Heisler, Ralph T.; and Cox, Frederick E., 4,803,028, Cl. 264-263.000.
True, Thomas T.; and Good, William E., 4,802,735, Cl. 350-162.120.
General Hospital Corporation, The: *See*—
Haber, Edgar; Mudgett-Hunter, Meredith; and Margolies, Michael, 4,803,167, Cl. 435-240.270.
General Instrument Corp.: *See*—
Horne, Donald R.; and Jeffers, John M., 4,803,725, Cl. 380-44.000.
General Motors Corporation: *See*—
Croat, John J., 4,802,931, Cl. 148-302.000.
Nowakowski, Robert J.; and Riesberg, Van V., Jr., 4,803,417, Cl. 320-48.000.
General Signal Corp.: *See*—
Weetman, Ronald J., 4,802,771, Cl. 366-270.000.
Gentiluomo, Joseph A. Bowling ballcu4,802,671, Cl. 273-63.00E.
Geolograph Pioneer, Inc.: *See*—
Williams, Henry L., 4,802,502, Cl. 137-382.000.
George, Clifford L., to Xerox Corporation. High speed duplicator with copy sheet prepackaged shipping and loading cartoncu4,802,586, Cl. 206-556.000.
GeoSpectra Corporation: *See*—
Pleitner, Peter K.; and Vincent, Robert K., 4,802,757, Cl. 356-2.000.
Gerlinger, Hermann; Hohberg, Gerhard; and Schneider, Horst, to Carl-Zeiss-Stiftung. Measuring apparatus for characterizing a surface having color directional reflectance propertiescu4,802,763, Cl. 356-319.000.
Geslewitz, Daniel G. Spatter shieldcu4,802,259, Cl. 16-251.000.
Gezari, Walter: *See*—
Reiss, James M.; Gezari, Walter; and Stidd, Robert, 4,802,462, Cl. 128-25.00R.
GH International Ltd.: *See*—
Marchant, Ian M., 4,802,624, Cl. 238-317.000.
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., to International Paper Company. Non-foil composite structures for packaging juicecu4,802,943, Cl. 156-244.230.
Giebel, Burkhard; and Theus, Ulrich, to Deutsche ITT Industries GmbH. Serial first-in-first-out (FIFO) memory and method for clocking the samecu4,803,657, Cl. 365-221.000.
Giede, Karl: *See*—
Ploog, Uwe; Busch, Peter; Thiele, Klaus; Hoffkes, Horst; and Giede, Karl, 4,803,068, Cl. 424-70.000.
Gifford, Charles R.; and Bigliardi, Achille M., to Sclavo, Inc. Two light source reference system for a fluorometercu4,802,768, Cl. 356-417.000.
Gilgenbach, Hubert S.; and Steiner, Ronald M., to Brunswick Corporation. Marine propeller with optimized performance blade contourcu4,802,822, Cl. 416-235.000.
Gilkey, Charlotte E.; and Gilkey, Hazel E. Aquarium filtercu4,802,980, Cl. 210-169.000.
Gilkey, Hazel E.: *See*—
Gilkey, Charlotte E.; and Gilkey, Hazel E., 4,802,980, Cl. 210-169.000.
Gillett, John B.; and Spreen, James H., to International Business Machines Corporation. D. C. to D. C. convertercu4,803,609, Cl. 363-17.000.
Gillette Canada Inc.: *See*—
Breuer, Miklos M.; and Hanak, Joseph A., 4,802,255, Cl. 15-159.00A.
Gillingham, Peter; and Erkku, Jan H., to Mitel Corporation. Analog phase locked loopcu4,803,705, Cl. 375-120.000.
Gillum, J. T., Sr. Wheelchair width reducing attachmentcu4,802,683, Cl. 280-304.100.
Gilmore, Charles B.; Kisak, James L.; Oberst, Jeffrey P.; Wood, John D.; and Baloh, Frank J., to Westinghouse Electric Corp. Nuclear reactor core component shipping containercu4,803,042, Cl. 376-272.000.
Giori, Francis A., to LTV A&D Sierra Research Division. Method for detecting a camouflaged object and systemcu4,803,489, Cl. 342-192.000.
Gitlin, Harvey S.: *See*—
Wilfong, Evan C.; and Gitlin, Harvey S., 4,802,566, Cl. 194-350.000.
Glaeser, Karl C.; and Buhr, Gerhard, to Ernst Peiniger GmbH Unternehmen fur Bautenschutz. Wet sand blasting with pressurized water feedcu4,802,312, Cl. 51-321.000.
Glascock, Homer H., II: *See*—
Burgess, James F.; Glascock, Homer H., II; Webster, Harold F.; Neugebauer, Constantine A.; and Loughran, James A., 4,803,450, Cl. 333-238.000.
Glaser, Hellmut I.: *See*—
Klink, Jerome P.; and Glaser, Hellmut I., 4,802,331, Cl. 57-246.000.
Glasteel Industrial Laminates, Inc.: *See*—
Barrell, David; Griffith, Gerald P.; Kennedy, Donald E.; and Rollen, Doanld C., 4,803,022, Cl. 264-25.000.
Glaxo Group Limited: *See*—
Richardson, Betty L., 4,803,196, Cl. 514-198.000.
Smith, Gordon C. D., 4,803,267, Cl. 540-224.000.
Gleim, Gunter: *See*—
Uhde, Dietmar; Gleim, Gunter; Schandl, Hartmut; Hoch, Peter; and Lehmann, Rudiger, 4,803,408, Cl. 318-254.000.
GMI Engineering & Management Institute: *See*—
Salmon, Michael E.; and Nemazi, John E., 4,802,605, Cl. 220-338.000.
Go, Hiromi: *See*—
Okamoto, Isao; Terada, Katsuyuki; Go, Hiromi; Sebata, Michio; Higaki, Hiroshi; and Takai, Hideo, 4,802,418, Cl. 105-167.000.
Godbersen, Byron L. Winch assembly for use with a boat trailer or the likecu4,802,685, Cl. 280-414.100.
Godfrey, Christopher R. A.: *See*—
Clough, John; and Godfrey, Christopher R. A., 4,802,913, Cl. 71-111.000.
Goel, Anil B., to Ashland Oil, Inc. Flexible, structural polyurethane adhesives with initial pressure sensitive adhesive performancecu4,803,257, Cl. 528-45.000.
Goethel, Walter W.: *See*—
Law, Kam W.; and Goethel, Walter W., 4,802,896, Cl. 51-298.000.
Gokenya, Takashi: *See*—
Kourogi, Isao; Masuda, Keiichi; Hirooka, Masami; Tomiyama, Yoshio; Yoshiuchi, Kazunori; and Gokenya, Takashi, 4,802,814, Cl. 414-686.000.
Gold Star Co. Ltd.: *See*—
Park, Chong S., 4,803,551, Cl. 358-147.000.
Goldstein, Gideon: *See*—
Kung, Patrick C.; and Goldstein, Gideon, 4,803,262, Cl. 530-387.000.
Goldstein, Vladimir L., to Sunwell Engineering Company Ltd. Corrugated plate heat exchangercu4,802,530, Cl. 165-94.000.
Gollestani, Maria. Therapeutic body suitcu4,802,469, Cl. 128-98.100.
Gonda, Gerald J.; and Farkas, Gregory J., to Tri-Tronics, Inc. Method and apparatus for remote control of animal training stimuluscu4,802,482, Cl. 119-29.000.
Good, William E.: *See*—
True, Thomas T.; and Good, William E., 4,802,735, Cl. 350-162.120.
Goode, Mark G.; Hasenberg, Daniel M.; McNeil, Thomas J.; and Spriggs, Thomas E., to Union Carbide Corporation. Method for reducing sheeting during polymerization of alpha-olefinscu4,803,251, Cl. 526-59.000.
Goodman, David E.; and Corenman, James E., to Nellcor Incorporated. Method and apparatus for detecting optical pulsescu4,802,486, Cl. 128-633.000.
Gordon, Stephen S.; Dyer, Gerald E.; and Flanigan, Lee A., to Rockwell International Corporation. Hollow electrode and arc initiation methodcu4,803,339, Cl. 219-145.210.
Gornati, Silvano; Viscardi, Roberto; and Coccetti, Silvano, to SGS Microelettronica S.p.A. Bias current compensating circuit, particularly for saw-tooth wave generatorscu4,803,381, Cl. 307-228.000.
Gorski, Robert A., to Du Pont de Nemours, E. I., and Company. Stabilized azeotrope or azeotrope-like composition of 1,1,2-trichloro-1,2,2-trifluoroethane, methanol and 1,2-dichloroethylenecu4,803,009, Cl. 252-171.000.
Gould Inc.: *See*—
Holmes, Richard E.; and Mays, Joe A., 4,803,464, Cl. 340-732.000.
Gouldy, Thomas E.; Knoll, William C.; Ritter, Ernest R., deceased (by Ritter, Faye E., executrix); Lynch, Thomas M.; Steffey, Ronald E.; White, Donald R.; and Brown, Robert E., to GTE Products Corporation. Electrical connectorcu4,802,859, Cl. 439-74.000.
Graber, John W., to Graber Products, Inc. Bicycle support standcu4,802,594, Cl. 211-20.000.
Graber Products, Inc.: *See*—
Graber, John W., 4,802,594, Cl. 211-20.000.
Grabovac, Bosko; and Kurtovic, Zlatko, to Consolidated Devices Inc. Electronic weighing scalescu4,802,540, Cl. 177-211.000.
Graebner, Peter; Sie, Swan A.; and Angehrn, Jorg A., to Chevron Research Company. Electrical phase measurement means and method for accurate determination of well logging cable lengthcu4,803,479, Cl. 340-860.000.
Graham, Martin H., to Rolm Corporation. Bus apparatus with a plurality of transmitterscu4,803,699, Cl. 375-36.000.

Graham, William H.; Bevel, Kenneth E.; Byrd, James D.; Junior, Kenneth E.; and Shepard, Inella G., to Morton Thiokol, Inc. Process for forming a liner and cast propellant charge in a rocket motor casingcu4,803,019, Cl. 264-3.100.

Grand Mirage: *See*—
Welck, Steve A., 4,802,750, Cl. 350-619.000.

Grassl, Gerhard: *See*—
Bain, William L., Jr.; Bedichek, Robert C.; Cox, George W.; Grassl, Gerhard; Peterson, Craig B.; Rattner, Justin R.; Singh, Gurbir; Singh, Gurbir; and Wipfli, John L., 4,803,622, Cl. 364-200.000.

Green, David T.; and Sienkiewicz, Henry R., to United States Surgical Corporation. Surgical stapling instrument and cartridgecu4,802,614, Cl. 227-19.000.

Green, William P.: *See*—
Hattan, Mark, 4,802,805, Cl. 411-263.000.

Greenhouse, Robert J.: *See*—
Muchowski, Joseph M.; Greenhouse, Robert J.; and Guzman, Angel, 4,803,269, Cl. 544-69.000.

Gregory, Charles. Hot gas defrost system for refrigeration systems and apparatus thereforcu4,802,339, Cl. 62-196.400.

Grellner, Wolfgang: *See*—
Schwetz, Karl-Alexander; Grellner, Wolfgang; Hunold, Klaus; Mohr, Max; and Lipp, Alfred, 4,803,183, Cl. 501-96.000.

Gresch, Heinrich: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,802,573, Cl. 201-39.000.

Grey, Ronald T.: *See*—
Chapdelaine, Albert H.; Kures, Vasek J.; and Grey, Ronald T., 4,803,083, Cl. 426-3.000.

Greyhawk Systems, Inc.: *See*—
Anglin, Noah L., 4,802,752, Cl. 350-631.000.

Griffin, Dennis; and Delves, Ronald F., to Frazer-Nash Limited. Air-carried missle launchercu4,802,400, Cl. 89-1.570.

Griffith, Gerald P.: *See*—
Barrell, David; Griffith, Gerald P.; Kennedy, Donald E.; and Rollen, Doanld C., 4,803,022, Cl. 264-25.000.

Griffiths, John W. Acoustic headgear-sun visor assemblycu4,802,243, Cl. 2-6.000.

Grillo, Susan M.: *See*—
Woznicki, Edward J.; and Grillo, Susan M., 4,802,924, Cl. 427-3.000.

Grimes, Elizabeth H., to Westinghouse Electric Corp. Cross tie random access memorycu4,803,658, Cl. 365-87.000.

Grinsted, Timothy W.; and Reece, Alan R., to Soil Machine Dynamics Limited. Pipeline or cable ploughcu4,802,793, Cl. 405-161.000.

Grobly, Walter; and Stocker, Bruno. Device for the storage of objects in a plurality of containerscu4,802,715, Cl. 312-299.000.

Gross, Clifford M., to Hospital For Joint Diseases Orthopedic Inst. Bag for mail and the likecu4,802,773, Cl. 383-16.000.

Gross, Kenny C., to United States of America, Energy. Expert system for surveillance and diagnosis of breach fuel elementscu4,803,040, Cl. 376-216.000.

Grossberg, Stephen; and Mingolla, Ennio, to Boston University, The Trustees of. Neural networks for machine visioncu4,803,736, Cl. 382-22.000.

Gruchalski, Albert: *See*—
Gruchalski, Henry; and Gruchalski, Albert, 4,802,393, Cl. 83-184.000.

Gruchalski, Henry; and Gruchalski, Albert, to Ecological Systems, Inc. Piercing diecu4,802,393, Cl. 83-184.000.

Grumman Aerospace Corporation: *See*—
Leib, Kenneth G.; and Jue, Suey L., deceased, 4,802,718, Cl. 350-3.600.

Grumman Aerospace Corportion: *See*—
Ryan, Robert E., 4,803,439, Cl. 330-4.300.

Gruner, Lucian: *See*—
Pilbrow, John R.; Troup, Gordon J. F.; Tirkel, Anatol Z.; Hutton, Donald R.; Gruner, Lucian; and McLaren, Neil R., 4,803,624, Cl. 324-316.000.

Grunstein, Michael M., to National Jewish Center for Immunology and Respiratory Medicine. Method for determining respiratory functioncu4,802,492, Cl. 128-720.000.

GTE Laboratories Incorporated: *See*—
Peters, Thomas E.; and Hunt, Roger B., Jr., 4,803,400, Cl. 313-489.000.

GTE Products Corporation: *See*—
Gouldy, Thomas E.; Knoll, William C.; Ritter, Ernest R., deceased; Lynch, Thomas M.; Steffey, Ronald E.; White, Donald R.; and Brown, Robert E., 4,802,859, Cl. 439-74.000.
Kopatz, Nelson E.; Ritsko, Joseph E.; and Johnson, Walter A., 4,802,915, Cl. 75-0.5AA.
Makar, Francis B., Jr.; and Fryburg, George A., 4,803,403, Cl. 313-624.000.
Munn, Robin W.; McClintic, Robert P.; and Reilly, Kenneth T., 4,803,062, Cl. 423-492.000.

Guebels, Pierre-Paul F.: *See*—
Dierckx, Rudolf F. I.; Sallaerts, Daniel; and Guebels, Pierre-Paul F., 4,803,648, Cl. 364-724.190.

Guilloux, Jean-Yvon: *See*—
Rivoallan, Loic; and Guilloux, Jean-Yvon, 4,802,729, Cl. 350-96.210.

Gulczynski, Zdzislaw. Switching power supplycu4,803,610, Cl. 363-70.000.

Guldager, Hans. Insolecu4,802,289, Cl. 36-43.000.

Gunn, Erwin T., to Boeing Company, The. Apparatus for unloading containerscu4,802,810, Cl. 414-414.000.

Gupta, Ashis S.: *See*—
Rudick, Arthur G.; Heenan, Richard H.; and Gupta, Ashis S., 4,802,343, Cl. 62-294.000.

Gurstein, Bernard; and Gurstein, Russell S., to U.S. Products, Inc. Cleaning machine for carpet, upholstery and draperiescu4,803,466, Cl. 340-603.000.

Gurstein, Russell S.: *See*—
Gurstein, Bernard; and Gurstein, Russell S., 4,803,466, Cl. 340-603.000.

Gustafson, Alan D.; and Unger, Richard F., to Thermo King Corporation. Protective grille and air flow straightener for transport refrigeration apparatuscu4,802,342, Cl. 62-239.000.

Guzman, Angel: *See*—
Muchowski, Joseph M.; Greenhouse, Robert J.; and Guzman, Angel, 4,803,269, Cl. 544-69.000.

Haack, August F. Precision rotary positioning mechanismcu4,802,386, Cl. 74-798.000.

Haarer, Rolf; Moser, Theo; and Reum, Klaus, to Robert Bosch GmbH. Sorting and orienting apparatuscu4,802,568, Cl. 198-388.000.

Haber, Edgar; Mudgett-Hunter, Meredith; and Margolies, Michael, to General Hospital Corporation, The. Monoclonal antidigoxin antibodiescu4,803,167, Cl. 435-240.270.

Haber, Terry M.; and Smedley, William H., to C. R. Bard, Inc. Hand-held instrument for implanting, dispensing, and inflating an inflatable membranecu4,802,479, Cl. 128-344.000.

Haga, Hiroyo: *See*—
Kashiwaya, Kunio; Haga, Hiroyo; Saeki, Nobuo; Yabuki, Youichi; Ozoe, Kuniyuki; Fukushima, Shinichi; and Tabata, Kazufumi, 4,802,270, Cl. 29-241.000.

Haghiri-Tehrani, Yahya; and Hoppe, Joachim, to Gao Gesellschaft fur Automation und Organisation mbH. Carrier element for an IC-modulecu4,803,542, Cl. 357-72.000.

Hagiwara, Haruo; Tsukamoto, Hideo; and Tsubaki, Yasuhiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Dry cleaning method using at least two kinds of solventscu4,802,253, Cl. 8-158.000.

Hakim, M. Javid, to Liburdi Engineering Limited. Vapor deposition of metal compound coating utilizing metal sub-halides and coated metal articlecu4,803,127, Cl. 428-457.000.

Hakuju Institute For Health Science Co., Ltd.: *See*—
Hara, Akikuni; and Ogawa, Yukio, 4,802,470, Cl. 128-24.100.

Hall, David R.; and Cross, Donald G., to Smith International, Inc. Polycrystalline diamond bearing system for a roller cone rock bitcu4,802,539, Cl. 175-329.000.

Hall, Jacquelyn L. O.: *See*—
Hall, S. Warren; and Hall, Jacquelyn L. O., 4,802,579, Cl. 206-366.000.

Hall, James W., II. Portable sheltercu4,802,501, Cl. 135-109.000.

Hall, John M., to Rix Industries. Sealed, self-contained, liquid-cooled, gas compressorcu4,802,826, Cl. 417-243.000.

Hall, S. Warren; and Hall, Jacquelyn L. O. Medical containercu4,802,579, Cl. 206-366.000.

Hallenbeck, Kirby S., to Intel Corporation. EPROM latch circuitcu4,803,659, Cl. 365-94.000.

Halliburton Company: *See*—
EerNisse, Errol P.; and Ward, Roger W., 4,802,370, Cl. 73-702.000.

Halverson, Ann M.: *See*—
Fong, Dodd W.; and Halverson, Ann M., 4,802,992, Cl. 210-709.000.

Hamada Printing Press Mfg. Co., Ltd.: *See*—
Fukuda, Akira; and Masuda, Itsuro, 4,802,632, Cl. 242-58.500.

Hamamoto, Takashi: *See*—
Haruta, Masahiro; Ozawa, Kunitaka; and Hamamoto, Takashi, 4,802,989, Cl. 210-688.000.

Hamelin, Ren'-Louis; and Wattier, Maurice F., to Equipments Automobiles Marchal. Device for controlling the displacement of an element, in particular of a seat or parts of a seat of a motor vehicle, in relation to a basecu4,802,373,a, Cl. 74-89.140.

Hammecke, Marie Elise Gisela, heiress: *See*—
Friedrich, Ronald; Hammecke, Werner, deceased; and Friedrich, Ronald, 4,802,526, Cl. 164-287.000.

Hammecke, Werner, deceased: *See*—
Friedrich, Ronald; Hammecke, Werner, deceased; and Friedrich, Ronald, 4,802,526, Cl. 164-287.000.

Hammer, Hartmut: *See*—
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Hanada, Masayuki: *See*—
Fukuda, Morio; Hanada, Masayuki; Inutsuka, Hideo; and Ogata, Katsuya, 4,802,840, Cl. 425-464.000.

Hanada, Takeshi: *See*—
Kametani, Masatsugu; Sugiyama, Kengo; Kogawa, Takashi; and Hanada, Takeshi, 4,803,613, Cl. 364-132.000.

Hanak, Joseph A.: *See*—
Breuer, Miklos M.; and Hanak, Joseph A., 4,802,255, Cl. 15-159.00A.

Hanashita, Kazuhiko: *See*—
Yamada, Izumi; Oishi, Tetsuya; and Hanashita, Kazuhiko, 4,802,891, Cl. 44-51.000.

Hancock, Michael T., to Torrington Company Ltd., The. Coupling member for taking up torque in a vehicle steering column and a vehicle steering column assemblycu4,802,881, Cl. 464-93.000.

Haneda, Makoto: *See*—
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,803,361, Cl. 250-227.000.

Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Apparatus for forming a multi-color toner imagecu4,803,518, Cl. 355-4.000.

Haneda, Satoshi: *See*—
Hiratsuka, Seiichiro; Haneda, Satoshi; and Shoji, Hisashi, 4,803,514, Cl. 355-4.000.

Hansen, Walter: *See*—
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Hara, Akikuni; and Ogawa, Yukio, to Hakuju Institute For Health Science Co., Ltd. Electric field therapy apparatuscu4,802,470, Cl. 128-24.100.

Hara, Hiromu: *See*—
Mase, Toshiyasu; Tsuzuki, Ryuji; Hara, Hiromu; Murase, Kiyoshi; and Tomioka, Kenichi, 4,803,211, Cl. 514-361.000.

Hara, Seiji; and Kobayashi, Satoshi, to Sanyo Electric Co., Ltd. Resetting systemcu4,803,682, Cl. 371-12.000.

Harada, Junzo, to Idemitsu Kosan Company Limited. Process for production of fibrous carbon materialcu4,803,123, Cl. 428-367.000.

Harada, Mineo: *See*—
Miyazawa, Akiyasu; Harada, Mineo; Tajima, Eiji; and Abe, Takao, 4,802,776, Cl. 400-124.000.

Harada, Toru; and Sato, Kozo, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide, reducing agent and polymerizable compoundcu4,803,148, Cl. 430-138.000.

Harano, Yutaka: *See*—
Shigeta, Yukio; Harano, Yutaka; Yamada, Shigeki; and Takahaski, Yoshinori, 4,803,158, Cl. 435-25.000.

Harase, Toshikatsu: *See*—
Minoura, Nobuo; Nakadai, Katsuo; Harase, Toshikatsu; and Iwamatsu, Satoshi, 4,803,573, Cl. 360-78.130.

Harashima, Konomi: *See*—
Kobayashi, Masakazu; Harashima, Konomi; and Ariyama, Hiroichi, 4,802,286, Cl. 34-15.000.

Harashima, Yasuhiro: *See*—
Hirata, Tadashi; Koyama, Katsumi; Takahashi, Hideaki; Harashima, Yasuhiro; Kitahara, Michio; Igarashi, Katsuyuki; Kitamura, Jun; Kikuchi, Hiroshi; and Narisada, Kimiyuki, 4,803,372, Cl. 250-561.000.

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Hardy, Jonathan: *See*—
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Hardy, Richard; Hardy, Jonathan; Kornell, Thomas J.; and Tallquist, Kenneth M., to Boeing Company, The. Horizontal-takeoff transatmospheric launch systemcu4,802,639, Cl. 244-2.000.

Hardy, Richard; and Neumann, Frank D., to Boeing Company, The. Method of providing rapid conversion of an aircraft weapon carriagecu4,802,641, Cl. 244-137.400.

Hardy, Steven; and Joyce, Robert H., to Teckknowledge, Inc. Basic expert system toolcu4,803,641, Cl. 364-513.000.

Harris Corporation: *See*—
Stratton, Boyd L., 4,803,547, Cl. 358-31.000.

Harris, Jesse R.: *See*—
Kukes, Simon G.; and Harris, Jesse R., 4,802,974, Cl. 208-217.000.

Harris, John L.: *See*—
Kenney, Andrew C.; Thompson, Philip W.; and Harris, John L., 4,802,981, Cl. 210-198.200.

Harrison, John A.; Isakson, Gary A.; and Nelson, James R., to Minnesota Mining and Manufacturing Company. Kit for preparing blister packagescu4,802,584, Cl. 206-447.000.

Harrod, Lawrence R.; and Siebern, Michael R., to Kransco. Selectable ratio transmission and visual identification of the ratiocu4,802,372, Cl. 74-325.000.

Hartmann, Klaus: *See*—
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Hartwig, Wolfgang, to Bayer Aktiengesellschaft & Chinese; and Chinese Academy of Medical Sciences. Gamma-butyrolactamscu4,803,285, Cl. 548-551.000.

Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, to Hitachi, Ltd.; and Hitachi Computer Peripherals Co., Ltd. Recording/reproducing method and apparatus of magnetic disk unit in which playback commences before the magnetic head is completely centered on the trackcu4,803,572, Cl. 360-60.000.

Haruta, Masahiro; Ozawa, Kunitaka; and Hamamoto, Takashi, to Canon Kabushiki Kaisha. System for purifying dyecu4,802,989, Cl. 210-688.000.

Hasebe, Kazunori: *See*—
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Hasegawa, Akira: *See*—
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Hasegawa, Atsushi: *See*—
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Hashimoto, Kiyoshi; Kimura, Kazuhisa; and Hatakeyama, Takashi, to Kabushiki Kaisha Toshiba. Image formation cartridge and image forming apparatus using the samecu4,803,502, Cl. 346-140.00R.

Hashimoto, Tsuneyuki: *See*—
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Hata, Seiji: *See*—
Nishida, Yoshie; Hata, Seiji; and Tsuji, Masao, 4,803,735, Cl. 382-8.000.

Hatada, Yuichi: *See*—
Kawashima, Yutaka; Satoh, Masakazu; Hatada, Yuichi; Hazato, Fumiko; Nakashima, Yoshimoto; and Sota, Kaoru, 4,803,266, Cl. 540-200.000.

Hatakeyama, Takashi: *See*—
Hashimoto, Kiyoshi; Kimura, Kazuhisa; and Hatakeyama, Takashi, 4,803,502, Cl. 346-140.00R.

Hatta, Yasushi; Mitsusada, Kazumichi; Tanaka, Hirotoshi; and Hayashi, Takehisa, to Hitachi, Ltd. Semiconductor integrated circuit device having semi-insulator substratecu4,803,527, Cl. 357-13.000.

Hattan, Mark, to Green, William P., a part interest. Fatigue resistant fasteners and related methodscu4,802,805, Cl. 411-263.000.

Hattori, Yumi: *See*—
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Haubner, Georg: *See*—
Fassel, Reinhard; Haubner, Georg; and Zobl, Hartmut, 4,803,590, Cl. 361-386.000.

Haug, Georg: *See*—
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Haugwitz, Rudiger D.; Naratanan, Venkatachala; Zalkow, Leon H.; Deutsch, Howard M.; and Gelbaum, Leslie, to United States of America, Health and Human Services. Substituted N-methyl derivatives of mitindomidecu4,803,202, Cl. 514-228.200.

Hauser, Josef: *See*—
Heynisch, Hinrich; Hauser, Josef; and Hubner, Erwin, deceased, 4,803,397, Cl. 313-337.000.

Hausselt, Juergen; Schittny, Stephan-U.; and Kaufmann, Dieter, to Demetron Gesellschaft Fuer Elektronik-Werkstoffe m.b.H. Method for making targetscu4,803,046, Cl. 420-83.000.

Hayakawa Rubber Co., Ltd.: *See*—
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Hayamizu, Mamoru, to Soartec Corp. Moveable ink jet thermal printing headcu4,803,499, Cl. 346-140.00R.

Hayano, Fuminori: *See*—
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Hayashi, Hiroshi: *See*—
Yamamoto, Osamu; Hayashi, Hiroshi; and Yamamoto, Saburo, 4,803,695, Cl. 372-92.000.

Hayashi, Kazutoshi; Nabetani, Hideo; Tanaka, Toshiaki; and Ishida, Kazushi, to Fujitsu Limited. Push button switch using dome spring and switch element thereofcu4,803,316, Cl. 200-406.000.

Hayashi, Shigenori; Hirose, Naoki; Inujima, Takashi; and Ito, Kenji, to Semiconductor Energy Laboratory Co., Ltd. Chemical vapor reaction process by virtue of uniform irradiationcu4,803,095, Cl. 427-54.100.

Hayashi, Takashi; Tokoro, Setsuo; Watanabe, Tomoyuki; and Shigematsu, Takashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling electro-magnetic particle clutchcu4,803,628, Cl. 364-424.100.

Hayashi, Takehisa: *See*—
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Hayashibara, Mikio: *See*—
Tanimoto, Hiroshi; and Hayashibara, Mikio, 4,803,382, Cl. 307-362.000.

Hayes, Paul C., Jr.; and Anderson, Steven D., to United States of America, Air Force. Hydrocarbon group-type analyzer systemcu4,802,986, Cl. 210-635.000.

Haynes International, Inc.: *See*—
Kessler, Harold D., 4,802,930, Cl. 148-12.70B.

Haynes, Joel E. Fluid flow sensorcu4,802,362, Cl. 73-249.000.

Haynie, Timothy J.: *See*—
Lawrence, Glen S.; Haynie, Timothy J.; Ferrario, Joseph D.; and Kyselica, Stefan P., 4,803,333, Cl. 219-121.130.

Hays, Brian; and Taylor, Clive. Piling hammercu4,802,538, Cl. 173-1.000.

Hazama, Yoshikazu: *See*—
Soneda, Mitsuo; and Hazama, Yoshikazu, 4,803,480, Cl. 340-784.000.

Hazan, Jean-Pierre: *See*—
Steers, Michel; Courdille, Michel; and Hazan, Jean-Pierre, 4,803,342, Cl. 219-257.000.

Hazato, Fumiko: *See*—
Kawashima, Yutaka; Satoh, Masakazu; Hatada, Yuichi; Hazato, Fumiko; Nakashima, Yoshimoto; and Sota, Kaoru, 4,803,266, Cl. 540-200.000.

Hazelton, Donald R.: *See*—
Kresge, Edward N.; and Hazelton, Donald R., 4,803,035, Cl. 264-519.000.

Heasly, Clyde C., Jr.: *See*—
Edwards, David G.; Finlay, Gerard; Boyle, David J.; Heasly, Clyde C., Jr.; Walsh, Joseph M.; and Poling, Ralph J., 4,802,412, Cl. 101-269.000.

Heden-Team Aktiengesellschaft: *See*—
Hedenberg, Gunnar, 4,803,086, Cl. 426-87.000.

Hedenberg, Gunnar, to Heden-Team Aktiengesellschaft. Automatically making food products such as bread, cakes and the likecu4,803,086, Cl. 426-87.000.

Hedengren, Kristina H. V.: *See*—
Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.

Heenan, Richard H.: *See*—
Rudick, Arthur G.; Heenan, Richard H.; and Gupta, Ashis S., 4,802,343, Cl. 62-294.000.

Heidrich, Gunther, to BHS - Bayerische Berg-, Hutten- and Salzwerke AG. Diaphragm disk assembly for torque transmitting joint and process for its fabricationcu4,802,882, Cl. 464-99.000.

Heidtmann, Denis L.: *See*—
Riley, Larry D.; and Heidtmann, Denis L., 4,803,531, Cl. 357-24.000.

Heimann, Alfred: *See*—
Ligacz, Herbert; Heimann, Alfred; Klosterhalfen, Hartwig; and Wittkopp, Helmut, 4,802,285, Cl. 33-551.000.

Heine, Gerold; and Stark, Joachim, to Dornier Medizintechnik GmbH. Removing a casting from a moldcu4,802,525, Cl. 164-48.000.

Heisler, Ralph T.: *See*—
Torossian, Kevork A.; Heisler, Ralph T.; and Cox, Frederick E., 4,803,028, Cl. 264-263.000.

Helbig, Gunter: *See*—
Barowski, Karlheinz; and Helbig, Gunter, 4,803,341, Cl. 219-222.000.

Held, Kurt. Apparatus for producing processed wood material panelscu4,802,837, Cl. 425-230.000.

Hellman, Robert R., Jr., to Eastman Kodak Company. Gel plate assembly for electrophoresiscu4,802,969, Cl. 204-299.00R.

Hellwig, Gerhard; Baur, Ottmar; Feisst, Klaus; Moehwald, Helmut; and Muenstedt, Helmut, to BASF Aktiengesellschaft. Solid-state capacitor with an electroconductive polymer as constituent of the solid electrolytecu4,803,596, Cl. 361-525.000.

Hendrix, Howard A.; Schmidt, Howard W., Jr.; and Ward, Ernest S., to International Business Machines Corporation. RF plasma processing apparatuscu4,802,968, Cl. 204-298.000.

Hendry, James D.: *See*—
Clarke, Stephen E.; Hendry, James D.; and Mijares, Ernest R., 4,802,415, Cl. 102-434.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Mueller, Heinz; and Herold, Claus-Peter, 4,802,998, Cl. 252-8.514.
Ploog, Uwe; Busch, Peter; Thiele, Klaus; Hoffkes, Horst; and Giede, Karl, 4,803,068, Cl. 424-70.000.
Wershofen, Thomas, 4,803,012, Cl. 252-544.000.

Henri, Antoine; Lefevre, Daniel; and Massicot, Patrick, to Commissariat A L'Energie Atomique. Process for the preparation of the surface of a uranium and titanium alloy member, particularly with a view to chemical nickel platingcu4,803,098, Cl. 427-309.000.

Henry, David W.: *See*—
Davis, James P.; and Henry, David W., 4,802,500, Cl. 135-97.000.

Hensler, J. Raymond, to Bausch & Lomb Incorporated. Dual purpose sunglass lens having gold appearance and method of manufacturecu4,802,755, Cl. 351-163.000.

Hensley, Norman G., to Teepak, Inc. Shirred tubular materialcu4,802,511, Cl. 138-118.100.

Hepfer, Rolf; and Runzler, Jurgen, to Joseph Kieninger Uhrenfabrik GmbH. Striking mechanism clock with switchable lifting stud cylindercu4,803,673, Cl. 368-269.000.

Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Single riser fluidized catalytic cracking process utilizing hydrogen and carbon-hydrogen contributing fragmentscu4,802,971, Cl. 208-13.000.

Hercules Incorporated: *See*—
Schroeder, Richard B., 4,802,413, Cl. 101-415.100.

Herman Miller, Inc.: *See*—
Beard, Michael D., 4,802,422, Cl. 108-64.000.

Hermans, Willem F., to Stork Amsterdam B.V. Method and apparatus for maintaining a mixture of products at a certain temperaturecu4,802,825, Cl. 416-231.00B.

Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Meszaros, Zoltan, deceased (by Meszaros, Marta, Marta Meszaros nee Boloni, heiresses); Ritli, Peter; Sipos, Judit; and Pajor, Aniko , to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Norfloxacin intermediatecu4,803,274, Cl. 546-13.000.

Hermonat, Mark W.: *See*—
Brandes, Lorne J.; and Hermonat, Mark W., 4,803,227, Cl. 514-651.000.

Herold, Claus-Peter: *See*—
Mueller, Heinz; and Herold, Claus-Peter, 4,802,998, Cl. 252-8.514.

Hervouet, Raymond: *See*—
Poldervaart, Leendert; and Hervouet, Raymond, 4,802,432, Cl. 114-230.000.

Hester, Richard K.; and de Wit, Michiel, to Texas Instruments Incorporated. Charge redistribution A/D converter with increased common mode rejectioncu4,803,462, Cl. 341-172.000.

Hewlett-Packard Company: *See*—
Mills, Louis T., 4,803,435, Cl. 324-456.000.

Heynacher, Erich, to Carl-Zeiss-Stiftung. Method and apparatus for lapping and polishing optical surfacescu4,802,309, Cl. 51-62.000.

Heynisch, Hinrich; Hauser, Josef; and Hubner, Erwin, deceased (by Hubner, Rosa Maria, legal representative), to Siemens Aktiengesellschaft. Indirectly heated dispenser metal capillary cathode for electrical discharge devicescu4,803,397, Cl. 313-337.000.

Heys, George, Jr.: *See*—
Lyons, Dale R.; Wills, David C.; and Heys, George, Jr., 4,803,346, Cl. 235-7.00R.

Hibble, William R.: *See*—
Kendig, John R.; Hibble, William R.; and Kiedrowski, James A., 4,803,413, Cl. 318-648.000.

Hibino, Junichi; and Ando, Eiji, to Director-General of the Agency of Industrial Science and Technology. Certain photochromic fulgide compounds and method for their synthesiscu4,803,287, Cl. 549-252.000.

Hickey, Thomas B., to OCLC Online Computer Library Center Incorporated. System and method for creating memory-retained, formatted pages of text, tabulation, and graphic datacu4,803,643, Cl. 364-523.000.

Hidawa, Yoshiyuki, to Yoshiyuki Corporation. Apparatus for producing cast productscu4,802,839, Cl. 425-439.000.

Hidrotronic Watercleaning Systems, Ltd.: *See*—
Miller, George, 4,802,991, Cl. 210-705.000.

Higaki, Hiroshi: *See*—
Okamoto, Isao; Terada, Katsuyuki; Go, Hiromi; Sebata, Michio; Higaki, Hiroshi; and Takai, Hideo, 4,802,418, Cl. 105-167.000.

Higashi, Kenji: *See*—
Ohno, Koichi; Higashi, Kenji; and Tateno, Hiroki, 4,803,524, Cl. 355-53.000.

Higashi, Koji: *See*—
Okada, Toyokazu; Higashi, Koji; and Taguchi, Satoshi, 4,802,745, Cl. 350-397.000.

Higashiizumi, Takao: *See*—
Sano, Shinichi; Takeuchi, Yasuhito; Tamezumi, Yoshiro; Higashiizumi, Takao; and Kakizawa, Tsuyoshi, 4,803,486, Cl. 340-825.790.

Higashino, Junichi: *See*—
Miyatake, Takafumi; Matsushima, Hitoshi; Ohtani, Shigeko; and Higashino, Junichi, 4,803,477, Cl. 340-747.000.

Highfill, Louis A., to Monsanto Company. Moisturized compositions of hydrate-forming phosphates and methods for preparation thereofcu4,803,058, Cl. 252-135.000.

Hijikata, Toshihiro: *See*—
Tominaga, Kanji; Hijikata, Toshihiro; Yamaguchi, Katsuhiro; Matsumoto, Yoshimichi; and Watanabe, Yasuo, 4,802,883, Cl. 474-101.000.

Hijiya, Toyoto; Takemoto, Tadashi; and Yukawa, Toshihide, to Ajinomoto Co., Inc. Process for separation of N-protected-α-L-aspartyl-L-phenylalaninescu4,803,300, Cl. 562-450.000.

Hikita, Mitsutaka; Saigo, Yoichi; and Kurosawa, Kazuhito, to Hitachi Video Engineering, Inc.; and Hitachi, Ltd. Filter combining surface acoustic wave resonatorscu4,803,449, Cl. 333-193.000.

Hikuma, Hideo, to Uniden Corporation. Antenna for wireless communication equipmentcu4,803,491, Cl. 343-702.000.

Hilbert, Samuel D.: *See*—
Pruett, Wayne P.; Hyatt, John A.; and Hilbert, Samuel D., 4,803,255, Cl. 527-400.000.
Weaver, Max A.; Pruett, Wayne P.; Hilbert, Samuel D.; and Burpitt, Robert D., 4,803,241, Cl. 524-719.000.

Hill, Fred C. Engine oil collector systemcu4,802,599, Cl. 220-1.00C.

Hill, Ralph H., Jr., to Southwest Research Institute. Optical inspection of polymer-based materialscu4,802,762, Cl. 356-318.000.

Hillemann, Craig L., to Du Pont de Nemours, E. I., and Company. Herbicidal 2-(1H)-pyrazinonescu4,802,908, Cl. 71-70.000.

Hilti Aktiengesellschaft: *See*—
Thurner, Elmar, 4,802,802, Cl. 411-107.000.

Hilton, Geoffrey T.: *See*—
Dawes, Ronald G.; Hilton, Geoffrey T.; Marshall, Anthony W.; and Bullivant, Derek, 4,802,532, Cl. 165-80.300.

Hilton, Paul G.: *See*—
Sill, Edward L.; and Hilton, Paul G., 4,803,173, Cl. 437-29.000.

Hindley, Richard M.: *See*—
Berge, John; and Hindley, Richard M., 4,803,293, Cl. 560-42.000.

Hinshaw, Walter L. Method of making braided rug constructioncu4,802,426, Cl. 112-262.100.

Hirabayashi, Akio; Kaneko, Katsuaki; and Okazaki, Yoshitake, to Shin-Etsu Polymer Co., Ltd. Compacting apparatus of rolled plastic filmscu4,802,408, Cl. 100-90.000.

Hiraiwa, Kazuyoshi, to Nissan Motor Co., Ltd. Automatic transmission's ravigneaux type planetary gear train having two ring gearscu4,802,385, Cl. 74-758.000.

Hirano, Sadashi: *See*—
Kako, Mitsumasa; and Hirano, Sadashi, 4,803,315, Cl. 200-5.00A.

Hirao, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Bipolar transistor integrated circuit and method of manufacturing the samecu4,803,174, Cl. 437-31.000.

Hirasawa, Masahide: *See*—
Kozuki, Susumu; Takei, Masahiro; Masui, Toshiyuki; Hirasawa, Masahide; and Kashida, Motokazu, 4,803,684, Cl. 371-31.000.

Hirata, Tadashi; Koyama, Katsumi; Takahashi, Hideaki; Harashima, Yasuhiro; Kitahara, Michio; Igarashi, Katsuyuki; Kitamura, Jun; Kikuchi, Hiroshi; and Narisada, Kimiyuki, to Amada Company, Limited. Line position detecting apparatus for detecting a V-shaped indentcu4,803,372, Cl. 250-561.000.

Hiratsuka, Seiichiro; Haneda, Satoshi; and Shoji, Hisashi, to Konishiroku Photo Industry Co., Ltd. Multi-color image forming method and apparatuscu4,803,514, Cl. 355-4.000.

Hiratsuka, Seiichiro; Matsunawa, Masahiko; and Abe, Yoshinori, to Konishiroku Photo Industry Co., Ltd. Halftone image estimation methods for dither imagescu4,803,558, Cl. 358-283.000.

Hiratsuka, Seiichiro: *See*—
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,803,518, Cl. 355-4.000.

Hirayama, Makoto, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for manufacturing semiconductor devicecu4,802,842, Cl. 432-5.000.

Hiro, Masaaki, to Canon Kabushiki Kaisha. Electrophotographic photosensitive membercu4,803,140, Cl. 430-58.000.

Hirochi, Katsuji, to Fujitsu Limited. Transistor-transistor logic circuitcu4,803,383, Cl. 307-456.000.

Hirohata, Toshio, to Nifco Inc. Plastic clip with resilient thread segments and hinged claspcu4,802,804, Cl. 411-433.000.

Hirooka, Masami: *See*—
Kourogi, Isao; Masuda, Keiichi; Hirooka, Masami; Tomiyama, Yoshio; Yoshiuchi, Kazunori; and Gokenya, Takashi, 4,802,814, Cl. 414-686.000.

Hirosaki, Botaro: *See*—
Rokugo, Yoshinori; and Hirosaki, Botaro, 4,803,680, Cl. 370-102.000.

Hirose Electric Co., Ltd.: *See*—
Kikuta, Shigeru, 4,802,860, Cl. 439-79.000.

Hirose, Mayumi: *See*—
Terada, Toshiyuki; Hirose, Mayumi; and Ishida, Kenji, 4,803,526, Cl. 357-15.000.

Hirose, Naoki: *See*—
Hayashi, Shigenori; Hirose, Naoki; Inujima, Takashi; and Ito, Kenji, 4,803,095, Cl. 427-54.100.

Hirose, Tsuneo: *See*—
Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, 4,803,572, Cl. 360-60.000.

Hirota, Hajime: *See*—
Ogino, Hidekazu; Kamitani, Hiroshi; Kamegai, Jun; Sawada, Hiroki; Hirota, Hajime; and Kurosaki, Tomihiro, 4,803,010, Cl. 252-174.210.

Hirota, Hozumi; Shimasaki, Yukihiro; Komoda, Hideaki; and Ota, Ikuo, to Matsushita Electric Industrial Co., Ltd. Magnetic recording mediumcu4,803,133, Cl. 428-695.000.

Hirsch, Charles F.: *See*—
Schwartz, Robert E.; Hirsch, Charles F.; Sigmund, Janet M.; and Pettibone, Douglas J., 4,803,217, Cl. 514-409.000.

Hirsch, John L.; and Wingender, Mark L., to Curt G. Joa, Inc. Stacker with a yoke-type stripping devicecu4,802,570, Cl. 414-790.000.

Hirschfeld, Tomas B.; and Wang, Francis T., to University of California, The Regents of the. pH-sensitive optrodecu4,803,049, Cl. 422-58.000.

Hitachi Automotive Eng. Co.: *See*—
Ishikura, Hisatsugu; and Saito, Shigeki, 4,802,543, Cl. 180-79.100.

Hitachi Chemical Co.: *See*—
Inayoshi, Hideo; Suzuki, Akira; Tsubosaki, Kunihiro; Ueda, Toyoichi; Makino, Daisuke; Ichimura, Nobuo; and Suzuki, Kazunari, 4,803,543, Cl. 357-72.000.

Hitachi Computer Peripherals Co., Ltd.: *See*—
Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, 4,803,572, Cl. 360-60.000.

Hitachi Koki Company, Ltd.: *See*—
Shinohara, Shigeru; and Suzuki, Shun, 4,803,410, Cl. 318-331.000.

Hitachi, Ltd.: *See*—
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,803,361, Cl. 250-227.000.
Banba, Fumiyasu; and Okami, Yoshinori, 4,803,614, Cl. 364-200.000.
Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, 4,803,572, Cl. 360-60.000.
Hatta, Yasushi; Mitsusada, Kazumichi; Tanaka, Hirotoshi; and Hayashi, Takehisa, 4,803,527, Cl. 357-13.000.
Hikita, Mitsutaka; Saigo, Yoichi; and Kurosawa, Kazuhito, 4,803,449, Cl. 333-193.000.
Inagami, Yasuhiro; Nakagawa, Takayuki; and Nagashima, Shigeo, 4,803,620, Cl. 364-200.000.
Inayoshi, Hideo; Suzuki, Akira; Tsubosaki, Kunihiro; Ueda, Toyoichi; Makino, Daisuke; Ichimura, Nobuo; and Suzuki, Kazunari, 4,803,543, Cl. 357-72.000.
Ishikura, Hisatsugu; and Saito, Shigeki, 4,802,543, Cl. 180-79.100.
Itoh, Kiyoo, 4,803,664, Cl. 365-210.000.
Kametani, Masatsugu; Sugiyama, Kengo; Kogawa, Takashi; and Hanada, Takeshi, 4,803,613, Cl. 364-132.000.
Kato, Makoto; Homma, Koichi; Komura, Fuminobu; and Furuya, Toshihiro, 4,803,358, Cl. 250-310.000.
Katoh, Seiji, 4,802,993, Cl. 210-725.000.
Kembo, Yukio; Ikeda, Minoru; and Taniguchi, Motoya, 4,803,712, Cl. 378-034.000.
Kobori, Shigeyuki; Yamada, Kazuji; Kobayashi, Ryoichi; Miyazaki, Atsushi; and Suzuki, Seikou, 4,802,952, Cl. 156-634.000.
Koike, Atsuyoshi; Ikeda, Shuji; and Nagasawa, Kouichi, 4,803,534, Cl. 357-71.000.
Kouda, Toyomasa, 4,803,541, Cl. 357-68.000.
Kumahora, Hiroki; Hashimoto, Tsuneyuki; and Nishimura, Eiichi, 4,803,356, Cl. 250-306.000.
Kumasaka, Noriyuki; Otomo, Shigekazu; Yamashita, Takeo; Zama, Hideo; and Morikawa, Juichi, 4,803,338, Cl. 360-122.000.
Kushida, Keiko; Takeuchi, Hiroshi; Kobayashi, Toshio; Takagi, Kazumasa; and Susa, Kenzo, 4,803,392, Cl. 310-311.000.
Matsuno, Hiromitsu; Ono, Tetsuo; and Murayama, Seiichi, 4,803,401, Cl. 313-489.000.
Miyatake, Takafumi; Matsushima, Hitoshi; Ohtani, Shigeko; and Higashino, Junichi, 4,803,477, Cl. 340-747.000.
Miyazawa, Akiyasu; Harada, Mineo; Tajima, Eiji; and Abe, Takao, 4,802,776, Cl. 400-124.000.
Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Orimo, Masayuki; Koizumi, Minoru; Kasajima, Hirokazu; and Nakai, Kozou, 4,803,683, Cl. 371-19.000.
Nakao, Takeshi; and Akiba, Yutaka, 4,803,674, Cl. 369-13.000.
Nishida, Yoshie; Hata, Seiji; and Tsuji, Masao, 4,803,735, Cl. 382-8.000.
Nishiyama, Tamotsu; Watanabe, Toshinori; Horie, Noboru; Furihata, Makoto; Kominami, Yasuo; and Mori, Fumihiko, 4,803,636, Cl. 364-491.000.
Noto, Yasuo; and Sugiura, Noboru, 4,803,629, Cl. 364-424.050.
Ogawa, Soichiro; and Sano, Toshihiko, 4,803,399, Cl. 313-493.000.
Okamoto, Isao; Terada, Katsuyuki; Go, Hiromi; Sebata, Michio; Higaki, Hiroshi; and Takai, Hideo, 4,802,418, Cl. 105-167.000.
Otaka, Tadashi, 4,803,369, Cl. 250-310.000.
Sakano, Shinji; and Matsumura, Hiroyoshi, 4,803,692, Cl. 372-50.000.
Sano, Koichi; Sato, Shinichi; Yokoyama, Tetsuo; and Koizumi, Hideaki, 4,803,431, Cl. 324-306.000.
Shinada, Hiroyuki; Todokoro, Hideo; and Fukuhara, Satoru, 4,803,430, Cl. 324-250.000.
Suefuji, Kazutaka; Kaneda, Aizo; Kanai, Yasuyuki; Nakamura, Shozo; Arata, Tetsuya; Kikuchi, Katsuaki; Senshu, Takao; Nakakado, Kimiaki; Maeda, Eiji; and Minakawa, Sadatsohi, 4,802,831, Cl. 418-55.000.
Suzuki, Kenji; Takagi, Toshiyuki; and Nishi, Tomoya, 4,803,653, Cl. 364-900.000.
Takahashi, Sadao, 4,803,355, Cl. 250-288.000.
Uchiyama, Kunio; Nishimukai, Tadahiko; and Hasegawa, Atsushi, 4,803,616, Cl. 364-200.000.
Uematsu, Takao; Suzuki, Hiroshi; Komatsuzaki, Shigeki; and Nakano, Fumio, 4,803,000, Cl. 252-32.500.
Usami, Kenichi; Kirihara, Seishin; Morimoto, Tadaoki; Doi, Hiroyuki; and Okada, Michiya, 4,802,894, Cl. 48-77.000.
Yasuda, Koichi; and Kimura, Yoshihiko, 4,802,874, Cl. 445-4.000.
Yasuda, Makoto; Miyashita, Tsune; Murayama, Seiichi; Arai, Yoji; and Yamada, Fuzio, 4,803,406, Cl. 315-174.000.

Hitachi Maxell, Ltd.: *See*—
Doi, Hajime; Akai, Norio; and Matsumoto, Fujio, 4,803,584, Cl. 360-133.000.
Fujiwara, Hideo; Sakemoto, Akito; and Inagoya, Osamu, 4,803,578, Cl. 360-105.000.
Kishimoto, Mikio; Nakazumi, Tetsuya; Kawai, Tomoji; and Kawai, Shichio, 4,803,132, Cl. 428-141.000.
Takeuchi, Yoji; and Sumiya, Kenji, 4,803,125, Cl. 428-411.100.

Hitachi Medical Corporation: *See*—
Matsumoto, Goro; and Shimizu, Koichi, 4,802,759, Cl. 356-376.000.
Onodera, Yoichi; Horiuchi, Hideyuki; and Shimbo, Chiaki, 4,803,354, Cl. 250-231.0SE.

Hitachi Metals, Ltd.: *See*—
Ohno, Takehiro; and Watanabe, Rikizo, 4,802,934, Cl. 148-404.000.

Hitachi Micro Computer Eng. Ltd.: *See*—
Nishiyama, Tamotsu; Watanabe, Toshinori; Horie, Noboru; Furihata, Makoto; Kominami, Yasuo; and Mori, Fumihiko, 4,803,636, Cl. 364-491.000.

Hitachi Microcomputer Eng. Ltd.: *See*—
Uchiyama, Kunio; Nishimukai, Tadahiko; and Hasegawa, Atsushi, 4,803,616, Cl. 364-200.000.

Hitachi Microcomputer Engineering Ltd.: *See*—
Inayoshi, Hideo; Suzuki, Akira; Tsubosaki, Kunihiro; Ueda, Toyoichi; Makino, Daisuke; Ichimura, Nobuo; and Suzuki, Kazunari, 4,803,543, Cl. 357-72.000.

Hitachi Tobu Semiconductor, Ltd.: *See*—
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,803,361, Cl. 250-227.000.

Hitachi Video Engineering, Inc.: *See*—
Hikita, Mitsutaka; Saigo, Yoichi; and Kurosawa, Kazuhito, 4,803,449, Cl. 333-193.000.

Hitzeman, Ronald A.; Levinson, Arthur D.; and Yansura, Daniel G., to Genentech, Inc. Preparation of hepatitis b surface antigen in yeastcu4,803,164, Cl. 435-68.000.

Hitzig, Geoffrey. Means for preventing air leakage through window sash interlockcu4,802,308, Cl. 49-406.000.

Ho, Winston: *See*—
Stanley, Kerry G.; and Ho, Winston, 4,803,218, Cl. 514-414.000.

Hobart Corporation: *See*—
Johnson, Thomas M., 4,802,340, Cl. 62-229.000.

Hobbelt, Hendrik J. H.; Burgemeister, Eduard A.; and Kroon, Theodorus J. P. M., to Research-Vereniging Nededlandse Kleding-En Tricotage-Industrie(RNKT). Process and device for removing the top ply from a stack of plies such as layers of fabriccu4,802,662, Cl. 271-20.000.
Hocart, Simon J.: *See*—
Coy, David H.; and Hocart, Simon J., 4,803,261, Cl. 530-333.000.
Hoch, Peter: *See*—
Uhde, Dietmar; Gleim, Gunter; Schandl, Hartmut; Hoch, Peter; and Lehmann, Rudiger, 4,803,408, Cl. 318-254.000.
Hochiki Corporation: *See*—
Matsuhita, Eiji, 4,803,469, Cl. 340-577.000.
Hocquaux, Michel: *See*—
Jacquet, Bernard; Hocquaux, Michel; Semeria, Didier; and Saint-Leger, Didier, 4,803,228, Cl. 514-714.000.
Hodgson, Philip K. G.; McShea, Julie A.; and Tinely, Edward J., to British Petroleum Company p.l.c., The. Removal of hydrogen sulphidecu4,802,973, Cl. 208-207.000.
Hoechst Aktiengesellschaft: *See*—
Dhar, Rajkumar; Venugopalan, Bindumadhavan; Chatterjee, Dipak K.; Rupp, Richard H.; and de Souza, Noel J., 4,803,204, Cl. 514-232.800.
Peiffer, Herbert; Crass, Guenther; Dietz, Wolfgang; and Schloegl, Gunter, 4,803,027, Cl. 264-210.500.
Thiem, Joachim; Deger, Hans-Matthias; Fritsche-Lang, Wolfram; and Kreuzer, Matthias, 4,803,263, Cl. 536-18.600.
Wellbrock, Werner; and Studeneer, Adolf, 4,803,015, Cl. 260-402.000.
Hoechst Celanese Corporation: *See*—
Mueller, Werner H.; Khanna, Dinesh N.; and Vora, Rohitkumar H., 4,803,147, Cl. 430-288.000.
Stautzenberger, A. Lee; and Kunkel, Robert W., 4,803,295, Cl. 560-78.000.
Hoeksema, Scot D.; and Williams, William H., to Westvaco Corporation. Continuous on-line conductivity probecu4,802,953, Cl. 162-263.000.
Hoffkes, Horst: *See*—
Ploog, Uwe; Busch, Peter; Thiele, Klaus; Hoffkes, Horst; and Giede, Karl, 4,803,068, Cl. 424-70.000.
Hoffmann, Friedrich; and Scheller, Franz X., to Daimler-Benz Aktiengesellschaft. Suspension system for rigid vehicle axlecu4,802,689, Cl. 280-688.000.
Hofmann, Raimund, to Folkmar, Jan. Spice dispenser arrangementcu4,802,608, Cl. 222-142.100.
Hogg, Dennis, to Micropolis Corporation. Low power buffer amplifiercu4,803,442, Cl. 330-274.000.
Hohberg, Gerhard: *See*—
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Hohlein, Peter: *See*—
Dietrich, Manfred; Pedain, Josef; Konig, Klaus; and Hohlein, Peter, 4,803,246, Cl. 525-124.000.
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Holmes, Richard E.; and Mays, Joe A., to Gould Inc. Analog display circuit including a wideband amplifier circuit for a high resolution raster display systemcu4,803,464, Cl. 340-732.000.
Holmes, Robert W. Sander attachmentcu4,802,310, Cl. 51-170.0MT.
Holt, Christopher E.; and Rollett, John M., to British Telecommunications public limited company. Transmission systemcu4,803,727, Cl. 381-1.000.
Holten, Petrus A. J., to U.S. Philips Corporation. Lamp vessel for multiple lamp typescu4,803,394, Cl. 313-113.000.
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, to Holter, Heinz. Process for wet quenching of cokecu4,802,573, Cl. 201-39.000.
Holzapfel, Heinz-Peter; and Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Modulo-2-adder for the logic-linking of three input signalscu4,803,649, Cl. 364-784.000.
Holzner, Gunter, to Firmenich S.A. Perfume composition with deodorising or antiperspirant actioncu4,803,195, Cl. 512-4.000.
Holzschuh, Wolfgang; and Ganter, Wolfgang, to Junghans Uhren GmbH. Prefabricated strip conductor network assembly unit and process for making samecu4,803,544, Cl. 357-72.000.
Homan Company, Inc.: *See*—
Homan, John F., 4,802,622, Cl. 238-10.00R.
Homan, Jerald M. Game arrowcu4,802,677, Cl. 273-416.000.
Homan, John F., to Homan Company, Inc. Single track mobile storage structure and methodcu4,802,622, Cl. 238-10.00R.
Homeyer, Bernhard: *See*—
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,803,215, Cl. 514-407.000.
Homma, Koichi: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
Mukai, Masato; and Komatsu, Koichi, 4,802,269, Cl. 29-149.50C.
Muto, Tetsuji; Matsuda, Shohei; Iwagawa, Yoshihiro; and Yahagi, Toshio, 4,802,711, Cl. 303-96.000.
Tanaka, Akira, 4,802,454, Cl. 123-425.000.
Tominaga, Kanji; Hijikata, Toshihiro; Yamaguchi, Katsuhiro; Matsumoto, Yoshimichi; and Watanabe, Yasuo, 4,802,883, Cl. 474-101.000.
Watanabe, Yoshimi; Kawamura, Hiroshi; and Sohda, Chiharu, 4,802,871, Cl. 440-75.000.
Yasuji, Kitasei, 4,802,682, Cl. 180-219.000.
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Honeywell Bull Inc.: *See*—
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Honeywell Inc.: *See*—
Garoutte, Kurt F., 4,803,135, Cl. 429-116.000.
Kendig, John R.; Hibble, William R.; and Kiedrowski, James A., 4,803,413, Cl. 318-648.000.
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Prysby, Daniel G., 4,803,465, Cl. 340-507.000.
Honkomp, Glenn A.: *See*—
Bowsky, Benjamin; Honkomp, Glenn A.; Burrows, Larry G.; and Wilson, Edward E., 4,803,136, Cl. 429-56.000.
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Shapler, Thomas A., 4,802,833, Cl. 425-131.100.
Hope, Stephen A., to British Petroleum Company p.l.c. Leaf springcu4,802,659, Cl. 267-149.000.
Hoppe, Joachim: *See*—
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,803,542, Cl. 357-72.000.
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Horikawa, Kazuo, to Fuji Photo Film Co. Ltd. Acceleration signal corrected motor speed control systemcu4,803,409, Cl. 318-310.000.
Horikoshi, Koki: *See*—
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Horn, Diane: *See*—
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Horne, Donald R.; and Jeffers, John M., to General Instrument Corp. Cryptographic system using interchangeable key blocks and selectable key fragmentscu4,803,725, Cl. 380-44.000.
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Horvath, Agnes: *See*—
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Hoshino, Osamu; and Chiku, Kazuyoshi, to Canon Kabushiki Kaisha. Image forming apparatuscu4,803,515, Cl. 355-4.000.
Hoshizaki, Hiroki; Oyobe, Kazuo; Suzuki, Hirofumi; Kawahara, Nobuaki; Niwa, Hitoshi; and Kageyama, Terutaka, to Nippondenso Co., Ltd. Ceramic heater apparatus with metal electrodescu4,803,345, Cl. 219-553.000.
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Hosoi, Noriyuki, to Fuji Photo Film Co., Ltd. Electrophotographic encapsulated pressure fixable toner particles with electroconductive powder coatingcu4,803,144, Cl. 430-106.600.
Hosoi, Yuichi; and Miyahara, Junji, to Fuji Photo Film Co., Ltd. Method for detecting radiation imagecu4,803,359, Cl. 250-327.200.
Hosoya, Toshio, to Toshiba Kikai Kabushiki Kaisha. Method and apparatus for controlling retracting speeds of injection molding machinescu4,802,267, Cl. 425-135.000.
Hospital For Joint Diseases Orthopedic Inst.: *See*—
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Hotta, Toshinori; and Yamamoto, Osamu, to NEC Corporation. Automatic electrical power control circuitcu4,803,440, Cl. 330-145.000.
Hotta, Yoshio; Ohnuma, Kenji; and Komura, Akihiko, to Canon Kabushiki Kaisha. Liquid crystal alignment layer containing polyvinylalcohol and titanium-alkoxidecu4,802,740, Cl. 350-341.000.
House Food Industrial Company Limited: *See*—
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Houston, Thomas T.; and Metzger, Raymond H., to Falcon Rehabilitation Products, Inc. Powered walkercu4,802,542, Cl. 180-65.500.

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Howeth, D. Franklin. Hopper loading directly insertable horizontally mounted cylindrical segmented bore pleated filter system for rotary broom sweeperscu4,802,983, Cl. 55-302.000.

Howington, Larry C.: *See*—
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Howlett, Charles W.: *See*—
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Hrboticky, Karel, to Molins PLC. Tobacco feed system for cigarette making machinecu4,802,497, Cl. 131-109.100.

Hsiao, Charles H.; and Kent, John S., to Syntex (U.S.A.) Inc. Controlled release naproxen and naproxen sodium tabletscu4,803,079, Cl. 424-468.000.

Hsin-hsin, Lo. Compound acceleration-brake pedal assemblycu4,802,381, Cl. 74-513.000.

Hsu, Walter W. Combined punch and clipcu4,802,789, Cl. 402-1.000.

Hsueh, Liming; and Reed, Marion G., to Chevron Research Company. Method of controlling permeability damage of hydrocarbon formations during steam injection while preventing pipe corrosioncu4,802,533, Cl. 166-252.000.

Hub, Karl-Rupprecht: *See*—
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Hubner, Rosa Maria, legal representative: *See*—
Heynisch, Hinrich; Hauser, Josef; and Hubner, Erwin, deceased, 4,803,397, Cl. 313-337.000.

Hudault, Gerard; and Netter, Pierre, to Aluminium Pechiney. Rotary blade-type apparatus for dissolving alloy elements and dispersing gas in an aluminum bathcu4,802,656, Cl. 266-225.000.

Hudec, Peter. Benefaction of concrete and aggregate using calcium phosphatecu4,802,923, Cl. 106-97.000.

Hudson Oxygen Therapy Sales Co.: *See*—
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Hughes Aircraft Company: *See*—
Curtis, Daniel L., 4,802,345, Cl. 62-514.00R.
Frazier, James F.; Otto, Oberdan W.; and Pasiecznik, John, Jr., 4,803,644, Cl. 364-559.000.
Gaalema, Steve D.; and Augustine, Frank L., 4,803,363, Cl. 250-338.400.
Jasper, Warren J., 4,802,767, Cl. 356-350.000.
Kebo, Reynold S., 4,802,717, Cl. 350-1.300.
Myer, Jon H., 4,803,336, Cl. 219-121.680.
Opina, Patricia B., 4,802,945, Cl. 156-247.000.
Pepper, David M.; and Craig, Richard R., 4,803,696, Cl. 372-95.000.
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Hughes Tool Company: *See*—
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Donatsch, Peter; Engel, Gunter; Hugi, Bruno; Richardson, Brian P.; Stadler, Paul A., deceased; Stadler, Hildegard R., heir; Stadler, Brigitte M., heir; Stadler, Sigrid A., heir; and Breuleux, Gerald, legal representative, 4,803,199, Cl. 514-214.000.

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Hung, Tung-Ping. Wheelbarrowcu4,802,681, Cl. 280-47.180.

Hunold, Klaus: *See*—
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Hunter Douglas Inc.: *See*—
Anderson, Richard N., 4,802,522, Cl. 160-168.100.

Hunter Douglas International N.V.: *See*—
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Hunter, Kevin D.: *See*—
Bator, Felika; Hunter, Kevin D.; and Durst, Robert T., Jr., 4,802,541, Cl. 177-212.000.

Hunter, Steven L.: *See*—
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Forbes, David R.; and Forbes, Carman S., 4,802,626, Cl. 239-36.000.

Hutton, Donald R.: *See*—
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Hyatt, John A.: *See*—
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Hydromatik GmbH: *See*—
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Ichiba, Tadayuki: *See*—
Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, 4,803,572, Cl. 360-60.000.

Ichikawa, Rinjiro; and Ishida, Toshio, to Toyoboseki Kabushiki Kaisha; and Fujimori Kogyo Co., Ltd. Electrode plates for liquid crystal display panelscu4,802,742, Cl. 350-339.00R.

Ichikoh Engineering, Ltd.: *See*—
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Ichimura, Nobuo: *See*—
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Ichinokawa, Kazuo: *See*—
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Ichitani, Yutaka; Imaeda, Masayoshi; Ikeda, Yoshimasa; Nishimura, Yoji; and Seikou, Kiyokazu, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Automotive air-conditionercu4,802,405, Cl. 98-2.060.

ICI Australia Limited: *See*—
Serban, Alexander; Watson, Keith G.; and Farquharson, Grame J., 4,803,273, Cl. 544-354.000.

Idemitsu Kosan Company Limited: *See*—
Harada, Junzo, 4,803,123, Cl. 428-367.000.

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Igarashi, Katsuyuki: *See*—
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Igarashi, Shigeru: *See*—
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Igelbuscher, Heinrich: *See*—
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Ignatowski, John J., to General Dynamics, Pomona Division. Electrical monitoring of flip-chip hybridizationcu4,803,422, Cl. 324-73.00R.

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Iida, Toshikatsu: *See*—
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Iida, Yoshimitsu; Terazono, Takashi; and Sumida, Shuji, to Chugai Seiyaku Kabushiki Kaisha. Method for production of stable nicorandil preparationcu4,803,213, Cl. 514-355.000.

Iizuka, Tetsuya: *See*—
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Ikeda, Hidekatsu; Miyama, Hidetoshi; and Kashiwabara, Yoshihiko, to Amada Company, Limited. Plate processing machinecu4,802,567, Cl. 198-345.000.

Ikeda, Hiroyuki; Matsumoto, Yukihiro; and Nishimura, Koyu, to Mitsubishi Rayon Company, Ltd. Process for preparation of acrylic resin sheets having excellent moldability and solvent resistancecu4,803,026, Cl. 264-216.000.

Ikeda, Kiyoshi, to NEC Corporation. Radio communications system with reduced D/U ratio variationscu4,803,738, Cl. 455-10.000.

Ikeda, Minoru: *See*—
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Ikeda, Shuji: *See*—
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Ikeda, Yoshimasa: *See*—
Ichitani, Yutaka; Imaeda, Masayoshi; Ikeda, Yoshimasa; Nishimura, Yoji; and Seikou, Kiyokazu, 4,802,405, Cl. 98-2.060.

Ikegaya, Yuji: *See*—
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Ikemoto, Hiroyuki: *See*—
Yasuike, Osamu; Arai, Yasuji; Ikemoto, Hiroyuki; Owa, Nobutaka; and Doi, Shunichi, 4,803,627, Cl. 364-424.050.

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IMA-Norte Maschinenfabriken Klessmann GmbH & Co.: *See*—
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Imaeda, Masayoshi: *See*—
Ichitani, Yutaka; Imaeda, Masayoshi; Ikeda, Yoshimasa; Nishimura, Yoji; and Seikou, Kiyokazu, 4,802,405, Cl. 98-2.060.

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Imaizumi, Hiraku: *See*—
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Imaizumi, Masaru: *See*—
Nishise, Hideya; Sakakibara, Susumu; and Imaizumi, Masaru, 4,803,513, Cl. 355-3.0DD.

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Imamura, Kazunori; Hayano, Fuminori; Kakizaki, Yukio; and Kobayashi, Jiro, to Nikon Corporation. Conveyor arm apparatus with gap detectioncu4,803,373, Cl. 250-561.000.

Imbault, Jean-Francois R.: *See*—
Gastebois, Philippe M. D.; and Imbault, Jean-Francois R., 4,802,824, Cl. 416-193.00A.

Imperial Chemical Industries PLC: *See*—
Brewster, Andrew G.; Brown, George R.; and Smithers, Michael J., 4,803,220, Cl. 514-452.000.
Cairns, John F., 4,802,962, Cl. 204-145.00R.
Clough, John; and Godfrey, Christopher R. A., 4,802,913, Cl. 71-111.000.
Ratcliffe, Arnold H., 4,803,201, Cl. 514-239.200.

Impink, Albert J., Jr.; Lipner, Melvin H.; and Mundy, Roger A., to Westinghouse Electric Corp. On line interactive monitoring of the execution of process operating procedurescu4,803,039, Cl. 376-216.000.

Ina, Hiroji: *See*—
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Ina, Kazuo: *See*—
Shibata, Toshiko; Ina, Hiroji; and Ina, Kazuo, 4,803,153, Cl. 435-2.000.

Inaba, Hiroshi; Shinnai, Masao; Nishikawa, Kazuya; Saitoh, Tamotsu; and Tsukada, Tokio, to Central Glass Company, Limited. Vehicle window glass antennacu4,803,492, Cl. 343-713.000.

Inagami, Yasuhiro; Nakagawa, Takayuki; and Nagashima, Shigeo, to Hitachi, Ltd. Multi-processor system responsive to pause and pause clearing instructions for instruction execution controlcu4,803,620, Cl. 364-200.000.

Inagoya, Osamu: *See*—
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Inayoshi, Hideo; Suzuki, Akira; Tsubosaki, Kunihiro; Ueda, Toyoichi; Makino, Daisuke; Ichimura, Nobuo; and Suzuki, Kazunari, to Hitachi, Ltd.; Hitachi Chemical Co.; and Hitachi Microcomputer Engineering Ltd. Semiconductor device and process for producing the samecu4,803,543, Cl. 357-72.000.

Ince, Francis: *See*—
Dixon, John; and Ince, Francis, 4,803,225, Cl. 514-654.000.

Inco Limited: *See*—
Victorovich, Grigori S.; Diaz, Carlos M.; O'Neill, Charles E.; Bell, James A. E.; and Timberg, Lloyd M., 4,802,916, Cl. 75-24.000.
Victorovich, Grigori S.; Diaz, Carlos M.; and O'Neill, Charles E., 4,802,917, Cl. 75-26.000.

Injectall Limited: *See*—
Bates, Kenneth W., 4,802,655, Cl. 266-218.000.

Inoue Japax Research Incorporated: *See*—
Kiyoshi, Inoue, 4,803,326, Cl. 219-69.00W.

Inoue, Noriyuki; Idota, Yoshio; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Method to form image for silver salt diffusion transfer using fogging agentcu4,803,146, Cl. 430-248.000.

Inoue, Yasuo; and Ikeda, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Raman microprobe apparatus for determining crystal orientationcu4,802,760, Cl. 356-31.000.

Inskeep, Eugene L., Jr. Solution and method for dissolving mineralscu4,802,990, Cl. 210-699.000.

Institut Elektrosvarki Imeni E.O. Patona Akademii Nak Ukrainskoi: *See*—
Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; and Zelensky, Vladimir F., 4,803,330, Cl. 219-97.000.

Intel Corporation: *See*—
Bain, William L., Jr.; Bedichek, Robert C.; Cox, George W.; Grasal, Gerhard; Peterson, Craig B.; Rattner, Justin R.; Singh, Gurbir; Singh, Gurbir; and Wipfli, John L., 4,803,622, Cl. 364-200.000.
Hallenbeck, Kirby S., 4,803,659, Cl. 365-94.000.

Intelock Corporation: *See*—
Corder, Thomas E.; and Mullin, James B., 4,802,353, Cl. 70-277.000.

Interatom GmbH: *See*—
Swars, Helmut, 4,803,189, Cl. 502-439.000.

Intermagnetics General Corporation: *See*—
Zeitlin, Bruce A.; Walker, Michael S.; and Motowidlo, Leszek R., 4,803,310, Cl. 174-128.00S.

International Business Machines Corporation: *See*—
Ahn, Kie Y.; Basavaiah, Saryadevara; Brodsky, Stephen B.; Cortellino, Charles A.; and Levine, Joseph E., 4,803,110, Cl. 428-137.000.
Ameen, Joseph G.; Carden, Timothy F.; Cutting, Lawrence R.; Engle, Stephen R.; and Moore, Ronald J., 4,803,100, Cl. 427-387.000.
Ashley, Donald J., 4,803,592, Cl. 361-79.000.
Buchmann, Peter L.; Vettiger, Peter; and Van Zeghbroech, Bart J., 4,803,181, Cl. 437-228.000.
Galkowski, Jan T., 4,803,651, Cl. 364-900.000.
Gillett, John B.; and Spreen, James H., 4,803,609, Cl. 363-17.000.
Hendrix, Howard A.; Schmidt, Howard W., Jr.; and Ward, Ernest S., 4,802,968, Cl. 204-298.000.
Johnson, William M., 4,803,615, Cl. 364-200.000.
Kraus, Charles J.; and Wu, Leon L., 4,803,595, Cl. 361-412.000.
Newell, Darryl C.; Schroeder, Karl F.; and Wilkie, Bruce J., 4,803,720, Cl. 379-202.000.
Ptaras, Peter A.; Tu, King-Ning; and Thompson, Richard D, 4,803,539, Cl. 357-67.000.

International Minerals & Chemical Corp.: *See*—
Sundelin, Kurt G. R.; Salasnitro, Joseph P.; and Stackhouse, Susan, 4,803,209, Cl. 514-249.000.

International Paper Company: *See*—
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., 4,802,943, Cl. 156-244.230.

Internationale Octrooimaatschappij "Octropa" B.V.: *See*—
Schledorn, Martin, 4,803,114, Cl. 428-208.000.

Inujima, Takashi: *See*—
Hayashi, Shigenori; Hirose, Naoki; Inujima, Takashi; and Ito, Kenji, 4,803,095, Cl. 427-54.100.

Inutsuka, Hideo: *See*—
Fukuda, Morio; Hanada, Masayuki; Inutsuka, Hideo; and Ogata, Katsuya, 4,802,840, Cl. 425-464.000.

Iolab Corporation: *See*—
Dunks, Gary B.; Yamada, Akira; Doddi, Namassivaya; and Beard, Charles D., 4,803,254, Cl. 525-477.000.

Ionics, Incorporated: *See*—
Waite, Warren A., 4,802,984, Cl. 210-490.000.

Iovine, Carmine P.; and Nowak, Frank A., Jr., to National Starch and Chemical Corporation. Hair care compositionscu4,803,071, Cl. 424-70.000.

Isaacs, Ralph G.: *See*—
Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.

Isaka, Tsutomu: *See*—
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Isakson, Gary A.: *See*—
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Isborn, Jack E., deceased; and Isborn, Nora S., heir. Humane raccoon trapcu4,802,301, Cl. 43-58.000.

Isborn, Nora S., heir: *See*—
Isborn, Jack E., deceased; and Isborn, Nora S., heir, 4,802,301, Cl. 43-58.000.

Isenhart, Kyle. Twisted carsbinercu4,802,264, Cl. 24-241.00P.

ISEO Serrature SPA: *See*—
Andreoli, Gian P., 4,802,352, Cl. 70-118.000.

Ishida, Kazushi: *See*—
Hayashi, Kazutoshi; Nabetani, Hideo; Tanaka, Toshiaki; and Ishida, Kazushi, 4,803,316, Cl. 200-406.000.

Ishida, Kenji: *See*—
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Ishida, Toshio: *See*—
Ichikawa, Rinjiro; and Ishida, Toshio, 4,802,742, Cl. 350-339.00R.

Ishihara, Shunichi; Saito, Keishi; Oda, Shunri; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Process for preparing a functional deposited filmcu4,803,093, Cl. 427-35.000.

Ishii, Keizou: *See*—
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Ishii, Satoru: *See*—
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,803,361, Cl. 250-227.000.

Ishijima, Minoru: *See*—
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Ishikawa, Kazuo: *See*—
Shinbori, Kenichi; and Ishikawa, Kazuo, 4,803,555, Cl. 358-213.190.

Ishikawa, Reiji; and Kimura, Tomohiro, to Sony Corporation. Method for producing a light transmitting filtercu4,803,337, Cl. 219-121.850.

Ishikawa, Sadanobu. Heat resistant materials containing ceramic componentscu4,803,182, Cl. 501-94.000.

Ishikura, Hisatsugu; and Saito, Shigeki, to Hitachi, Ltd.; and Hitachi Automotive Eng. Co. Electric power steering devicecu4,802,543, Cl. 180-79.100.

Ishino, Iwao: *See*—
Shimada, Takeo; Isaka, Tsutomu; Okada, Noriyuki; Ishino, Iwao; and Usami, Nobuhiro, 4,802,892, Cl. 44-62.000.
Ishizaka, Hideo: *See*—
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Ishizaki, Masahiko: *See*—
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Isreal, Noah D. Trailer hitchcu4,802,686, Cl. 280-477.000.
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Ita, Noboru; and Mitsugi, Shigeru, to Panafacom Limited. Multiprocessor system having common memorycu4,803,618, Cl. 364-200.000.
Ito, Kenji: *See*—
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Ito, Koichi: *See*—
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Itoh, Hajime: *See*—
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Itoh, Hiroyuki; Kono, Yoshitsugu; Ajioka, Masanobu; Takenaka, Shinji; and Kataita, Masafumi, to Mitsui Toatsu Chemicals, Incorporated. Production process of chlorinecu4,803,065, Cl. 423-502.000.
Itoh, Kiyoo, to Hitachi, Ltd. Dynamic random access memory having a gain functioncu4,803,664, Cl. 365-210.000.
ITT Composants Et Instruments: *See*—
Lefebvre, Jean-Claude, 4,803,321, Cl. 200-517.000.
ITT Gilfillan, A Division of ITT Corporation: *See*—
Kruger, Bradford E., 4,803,490, Cl. 342-158.000.
ITT Industries, Inc.: *See*—
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Ives, Milton N.: *See*—
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Iwagawa, Yoshihiro: *See*—
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Iwamoto, Yoshihiro, to Kabushiki Kaisha Toshiba. Liquid crystal display control devicecu4,802,739, Cl. 350-332.000.
Iwao Jiki Kogyo Co., Ltd.: *See*—
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Iwatani, Shiro; and Tokugawa, Kazuya, to Mitsubishi Denki Kabushiki Kaisha. Starter motor control device for enginescu4,803,377, Cl. 290-38.00R.
Izawa, Fumio; and Shinozaki, Masayuki, to Kabushiki Kaisha Toshiba. Non-contact reading type IC card with pre-enhancement functioncu4,803,350, Cl. 235-492.000.
Izzo, Peter G., to Eastman Kodak Company. Sliding plate assemblycu4,803,511, Cl. 355-3.00R.
J. I. Case Company: *See*—
Nystuen, Paul A.; Batcheller, Barry D.; Brekkestran, Kevin L.; and Kraning, Calvin J., 4,802,545, Cl. 180-135.000.
J. M. Voith GmbH: *See*—
Stodt, Enno, 4,802,375, Cl. 74-358.000.
Stodt, Enno, 4,802,564, Cl. 192-70.280.
J-10, Inc.: *See*—
Jones, Mark G., 4,802,709, Cl. 298-10.000.
Jabbour, Jameel H.: *See*—
Silvis, Salvatore J.; and Jabbour, Jameel H., 4,802,835, Cl. 425-205.000.
Jackson, Christopher A. Locating device used with electrical outlet boxes and the likecu4,802,284, Cl. 33-528.000.
Jacobsen, Preben, to Jamo Hi-Fi A/S. Loudspeaker unitcu4,802,551, Cl. 181-146.000.
Jacoby, Elliot G., Jr.; D'Aleo, Michael J.; Luchaco, David G.; Spira, Joel S.; Wagner, Richard A.; Yuhasz, Stephen J.; and Dowler, David H., to Lutron Electronics Co., Inc. Cover and support plate arrangement for wall mounted devicescu4,803,380, Cl. 307-157.000.
Jacolin, Richard: *See*—
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Jacquet, Bernard; Hocquaux, Michel; Semeria, Didier; and Saint-Leger, Didier, to L'Oreal. Unsaturated aromatic peroxides and their use in pharmaceutical and cosmetic compositionscu4,803,228, Cl. 514-714.000.
Jacquinet, Jean-Claude; Petitou, Maurice; Sinay, Pierre; and Choay, Jean, to Choay, S.A. Method for carrying out the organic synthesis of oligosaccharides containing galactosamine-uronic acid patterns, now oligosaccharides obtained and biological applications thereofcu4,803,265, Cl. 536-123.000.
Jaen, Juan C.: *See*—
Caprathe, Bradley W.; DeWald, Horace A.; Jaen, Juan C.; and Wise, Lawrence D., 4,803,203, Cl. 514-230.500.
James River-Norwalk, Inc.: *See*—
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Jamison, Wayne L. Mobile antenna circuit with variable line lengthcu4,803,493, Cl. 343-745.000.
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Japan Gore-Tex, Inc.: *See*—
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Dvorscek, John; Rostoker, William; and Jarnholm, Arne R., 4,802,995, Cl. 210-761.000.
Jarvis, Allan P., Jr., to Damon Biotech, Inc. Microencapsulation with polymerscu4,803,168, Cl. 435-240.220.
Jasper, Warren J., to Hughes Aircraft Company. Method and apparatus for optical nutation sensingcu4,802,767, Cl. 356-350.000.
Jay, Thomas L.: *See*—
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Jean Walterscheid GmbH: *See*—
Geisthoff, Hubert, 4,802,326, Cl. 56-10.300.
Jeantin, Phillipe: *See*—
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Horne, Donald R.; and Jeffers, John M., 4,803,725, Cl. 380-44.000.
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Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. 5-Heterocyclyl-1-aryl-pyrazoles, composition containing them, and method of using them to combat insects, acarids and nematodescu4,803,215, Cl. 514-407.000.
Jensen, Otto S. Combination dustpan and guide means for filling trash containers and the likecu4,802,258, Cl. 15-257.100.
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Johnson, Edward L.: *See*—
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Johnson, Gale, to Fort Lock Corporation. High security pin tumbler lockcu4,802,354, Cl. 70-491.000.
Johnson, James R., to AMI, Inc. Continuous draw tape bagscu4,802,582, Cl. 206-390.000.
Johnson, Raymond A. Tip trimmer assembly for a caulking guncu4,802,607, Cl. 222-82.000.
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Johnson, Walter A.: *See*—
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Johnson, William M., to International Business Machines Corporation. Microcode control of a parallel architecture microprocessorcu4,803,615, Cl. 364-200.000.
Johnston, G. Gilbert. Catheter for performing volumetric flow rate determination in intravascular conduitscu4,802,490, Cl. 128-661.080.
Johnston, Michael G.: *See*—
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Jones, Everett E., to Boeing Company, The. Apparatus and method of compensating for springback in a workpiececu4,802,357, Cl. 72-389.000.
Jones, K. Tom: *See*—
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Jones, Winton D.; Schnettler, Richard A.; Claxton, George P.; and Dage, Richard C., to Merrell Dow Pharmaceuticals Inc. Cardiotonic tricyclic oxazolonescu4,803,210, Cl. 514-293.000.

Jonsson, Stig, to Landstingens inkopscentral LIC, ekonomisk forening. Surgical operating room lamp or similar lampcu4,803,607, Cl. 362-250.000.
Joseph Kieninger Uhrenfabrik GmbH: *See*—
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Jue, Suey L., deceased: *See*—
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Juag, Sakun J. Emergency air supply devicecu4,802,472, Cl. 128-204.180.
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Kabushi Kaisha Toshiba: *See*—
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Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
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Hashimoto, Kiyoshi; Kimura, Kazuhisa; and Hatakeyama, Takashi, 4,803,502, Cl. 346-140.00R.
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Kawakami, Haruko; Sekizawa, Hidekazu; and Yamamoto, Naofumi, 4,803,496, Cl. 346-76.0PH.
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Saito, Tamio; Takayama, Satoshi; Suda, Yoshiyuki; Shimada, Osamu; and Mori, Ken-ichi, 4,803,375, Cl. 250-578.000.
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Kako, Mitsumasa; and Hirano, Sadashi, to Brother Kogyo Kabushiki Kaisha. Printed circuit boardcu4,803,315, Cl. 200-5.00A.
Kaku, Shigeru: *See*—
Uo, Junko; Nishimura, Masaji; Horiguchi, Kazuo; Nakanishi, Setsuko; and Kaku, Shigeru, 4,803,154, Cl. 435-7.000.
Kakubo, Yuji: *See*—
Niimi, Koji; Kakubo, Yuji; and Ikegaya, Yuji, 4,803,731, Cl. 381-63.000.
Kali-Chemie Pharma GmbH: *See*—
Ohlendorf, Heinrich-Wilhelm; Kaupmann, Wilhelm; Kuehl, Ulrich; Buschmann, Gerd; and Magda, Stephen J., 4,803,198, Cl. 514-212.000.
Kaltschmid, Helmut: *See*—
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Kameda, Yukihiko: *See*—
Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, 4,803,303, Cl. 564-462.000.
Kamegai, Jun: *See*—
Ogino, Hidekazu; Kamitani, Hiroshi; Kamegai, Jun; Sawada, Hiroki; Hirota, Hajime; and Kurosaki, Tomihiro, 4,803,010, Cl. 252-174.210.
Kametani, Masatsugu; Sugiyama, Kengo; Kogawa, Takashi; and Hanada, Takeshi, to Hitachi, Ltd. Decentralized master-slave control apparatuscu4,803,613, Cl. 364-132.000.
Kameyama, Mutsumi: *See*—
Kobayashi, Yukio; Takeuchi, Masataka; Kameyama, Mutsumi; Ohira, Manabu; Kikuta, Yoshikazu; and Takahashi, Toyohiko, 4,803,138, Cl. 429-194.000.
Kamimoto, Toshihiko: *See*—
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Kamio, Masaru: *See*—
Takao, Hideaki; Motoi, Taiko; Sekimura, Nobuyuki; Kamio, Masaru; and Murata, Tatsuo, 4,802,743, Cl. 350-339.00F.
Kamitani, Hiroshi: *See*—
Ogino, Hidekazu; Kamitani, Hiroshi; Kamegai, Jun; Sawada, Hiroki; Hirota, Hajime; and Kurosaki, Tomihiro, 4,803,010, Cl. 252-174.210.
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Kamoda, Tamotsu: *See*—
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Suefuji, Kazutaka; Kaneda, Aizo; Kanai, Yasuyuki; Nakamura, Shozo; Arata, Tetsuya; Kikuchi, Katsuaki; Senshu, Takao; Nakakado, Kimiaki; Maeda, Eiji; and Minakawa, Sadatsohi, 4,802,831, Cl. 418-55.000.
Kanamaru, Tsuneo; Shinagawa, Susumu; and Muroi, Masayuki, to Takeda Chemical Industries, Ltd. 2-oxo-5-methyl-6-[4-heptene]-2H-pyrano[3,2-c]pyridinecu4,803,275, Cl. 546-116.000.
Kanazawa, Motoki: *See*—
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Kanda, Hitoshi; and Kato, Masayoshi, to Canon Kabushiki Kaisha. Process for size separating toner particlescu4,802,977, Cl. 209-143.000.
Kanda, Nobuo; Abe, Yukihiro; and Kondo, Mitsuru, to Kanzaki Paper Manufacturing Co., Ltd. Heat-sensitive recording material using chromeno compoundcu4,803,193, Cl. 503-209.000.
Kaneda, Aizo: *See*—
Suefuji, Kazutaka; Kaneda, Aizo; Kanai, Yasuyuki; Nakamura, Shozo; Arata, Tetsuya; Kikuchi, Katsuaki; Senshu, Takao; Nakakado, Kimiaki; Maeda, Eiji; and Minakawa, Sadatsohi, 4,802,831, Cl. 418-55.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Fushiki, Yasuo; Isshiki, Minoru; Nakano, Hiroshi; Oizumi, Masayuki; Shimomura, Masayoshi; and Imajo, Keiji, 4,803,115, Cl. 428-285.000.
Kaneiwa, Shinji: *See*—
Takiguchi, Haruhisa; Kaneiwa, Shinji; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,803,690, Cl. 372-45.000.
Kaneko, Katsuaki: *See*—
Hirabayashi, Akio; Kaneko, Katsuaki; and Okazaki, Yoshitake, 4,802,408, Cl. 100-90.000.
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Miyake, Izumi; Kaneko, Kiyotaka; and Oda, Kazuya, 4,803,568, Cl. 360-33.100.
Kaneko, Toshimi: *See*—
Tomono, Kunisaburo; Mandai, Harufumi; Kawabata, Toshio; Sakamoto, Yukio; Tsunematsu, Toyoaki; and Kaneko, Toshimi, 4,803,453, Cl. 336-183.000.
Kanesaka, Hiroshi, to Usui Kokusai Sangyo Kabushiki Kaisha; and Kabushiki Kaisha Kanesaka Gijutsu Kenkyusho. Engine intake systemcu4,802,452, Cl. 123-376.000.
Kaniut, Christopher P.; and Dittmer, Howard R., to Rockwell International Corporation. Tapered ball valvecu4,802,652, Cl. 251-181.000.

Kanno, Masahide: *See*—
Yabe, Hisao; Kimura, Kenji; Kanno, Masahide; Tsuji, Kiyoshi; Yoshinaga, Jun; Yokoi, Takeshi; Ozeki, Kazuhiko; Nishigaki, Shinichi; Nakamura, Takeaki; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,803,550, Cl. 358-98.000.

Kanzaki Kokyukoki Mfg. Co. Ltd.: *See*—
Sakikawa, Shigenori; and Okanishi, Toshiaki, 4,802,546, Cl. 180-132.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Kanda, Nobuo; Abe, Yukihiro; and Kondo, Mitsuru, 4,803,193, Cl. 503-209.000.

Kao Corporation: *See*—
Ogino, Hidekazu; Kamitani, Hiroshi; Kamegai, Jun; Sawada, Hiroki; Hirota, Hajime; and Kurosaki, Tomihiro, 4,803,010, Cl. 252-174.210.

Karinen, Timothy J., to PPG Industries, Inc. Composition and method for producing vitamin-enriched milkcu4,803,087, Cl. 426-73.000.

Kasa, Yasushi, to Fujitsu Limited. Signal transition detection circuitcu4,803,665, Cl. 365-230.000.

Kasai, Kazumi, to Yoshida Kogyo K. K. Buckle assemblycu4,802,262, Cl. 24-606.000.

Kasajima, Hirokazu: *See*—
Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Orimo, Masayuki; Koizumi, Minoru; Kasajima, Hirokazu; and Nakai, Kozou, 4,803,683, Cl. 371-19.000.

Kashida, Motokazu; Masui, Toshiyuki; Fukatsu, Tsutomu; Takahashi, Koji; Takei, Masahiro; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Rotary head type multichannel information signal reproducing apparatus having sub-information search functioncu4,803,570, Cl. 360-61.000.

Kashida, Motokazu: *See*—
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Kashihara, Akio: *See*—
Kida, Katsuaki; Kashihara, Akio; Ishii, Keizou; and Kayano, Hiromichi, 4,803,252, Cl. 526-297.000.

Kashima, Masao: *See*—
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Kashiwabara, Yoshihiko: *See*—
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Kashiwaya, Kunio; Haga, Hiroyo; Saeki, Nobuo; Yabuki, Youichi; Ozoe, Kuniyuki; Fukushima, Shinichi; and Tabata, Kazufumi, to Nippon Steel Corp.; and Nippon Steel Welding Products & Engineering Co., Ltd. Apparatus for passing optical fibers through tubular productscu4,802,270, Cl. 29-241.000.

Kaspar, Klaus P.: *See*—
Baier, Manfred; Kaspar, Klaus P.; Schafer, Rainer; Trager, Ulrich; and Notzel, Siegfried, 4,803,171, Cl. 436-530.000.

Kaspers, Helmut: *See*—
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Kataita, Masafumi: *See*—
Itoh, Hiroyuki; Kono, Yoshitsugu; Ajioka, Masanobu; Takenaka, Shinji; and Kataita, Masafumi, 4,803,065, Cl. 423-502.000.

Katayama, Nobuaki; Sasaki, Kan; Koide, Takeharu; and Takimura, Keisuke, to Toyota Jidosha Kabushiki Kaisha. Power transfer device for four-wheel drivecu4,802,383, Cl. 74-711.000.

Kato, Makoto; Homma, Koichi; Komura, Fuminobu; and Furuya, Toshihiro, to Hitachi, Ltd. Scanning electron microscopecu4,803,358, Cl. 250-310.000.

Kato, Masaaki: *See*—
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Kato, Masayoshi: *See*—
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Kato, Mikio, to Brother Kogyo Kabushiki Kaisha. Method of controlling a step motorcu4,803,414, Cl. 318-696.000.

Kato, Shozo, to Tokuyama Soda Kabushiki Kaisha. Substituted aminophenyl urea derivativescu4,803,223, Cl. 514-521.000.

Kato, Shozo: *See*—
Takematsu, Tetsuo; Kato, Shozo; Ishizaki, Masahiko; and Suyama, Toshihisa, 4,802,907, Cl. 71-90.000.

Katoh, Hiromasa: *See*—
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Katoh, Seiji, to Hitachi, Ltd. Method of treating liquid wastes containing heavy metal chelate compoundscu4,802,993, Cl. 210-725.000.

Kaubek, Fritz: *See*—
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Kaufman, Sidney L.: *See*—
Klashka, John A.; Kaufman, Sidney L.; Kowal, Krzysztof A.; Lewis, Richard P.; Raisbeck, Susan L.; and McNamara, John L., Jr., 4,803,623, Cl. 364-200.000.

Kaufmann, Dieter: *See*—
Hausselt, Juergen; Schittny, Stephan-U.; and Kaufmann, Dieter, 4,803,046, Cl. 420-83.000.

Kaukeinen, Joseph Y., to Eastman Kodak Company. In-depth electrode light valve array devices and improved fabrication method thereforcu4,802,741, Cl. 350-392.000.

Kaupmann, Wilhelm: *See*—
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Kausch, James R., to Munck Automation Technology, Inc. Automatic guided vehicle safety systemcu4,802,548, Cl. 180-274.000.

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Kawabata, Toshio: *See*—
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Kawagishi, Masao: *See*—
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Kawagoe, Takahiro: *See*—
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Kawahara, Nobuaki: *See*—
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Kawahara, Yoshiaki: *See*—
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Kawahuti, Junsei: *See*—
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Kawai, Shichio: *See*—
Kishimoto, Mikio; Nakazumi, Tetsuya; Kawai, Tomoji; and Kawai, Shichio, 4,803,132, Cl. 428-141.000.

Kawai, Tomoji: *See*—
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Kawakami, Eigo: *See*—
Baba, Takeshi; Suda, Shigeyuki; Nose, Noriyuki; Kawakami, Eigo; Nakajima, Toshiyuki; and Kushibiki, Nobuo, 4,802,746, Cl. 350-418.000.

Kawakami, Haruko; Sekizawa, Hidekazu; and Yamamoto, Naofumi, to Kabushiki Kaisha Toshiba. Method for recording a color imagecu4,803,496, Cl. 346-76.0PH.

Kawakami, Shigenobu: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Matsuzaka, Eiichi; and Narui, Satoshi, 4,803,238, Cl. 524-486.000.

Kawamura, Hiroshi: *See*—
Watanabe, Yoshimi; Kawamura, Hiroshi; and Sohda, Chiharu, 4,802,871, Cl. 440-75.000.

Kawamura, Tomihiko: *See*—
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Kawano, Katsumi: *See*—
Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Orimo, Masayuki; Koizumi, Minoru; Kasajima, Hirokazu; and Nakai, Kozou, 4,803,683, Cl. 371-19.000.

Kawasaki Steel Corp.: *See*—
Sato, Kouki; Matsuyama, Junya; and Nishiyama, Noboru, 4,803,340, Cl. 219-146.100.

Kawasaki, Tutomu: *See*—
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,803,361, Cl. 250-227.000.

Kawashima, Yutaka; Satoh, Masakazu; Hatada, Yuichi; Hazato, Fumiko; Nakashima, Yoshimoto; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. 3-Oxoalkylidene-2-azetidinone derivativescu4,803,266, Cl. 540-200.000.

Kawata, Tomoshi: *See*—
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Kayano, Hiromichi: *See*—
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Kazakov, Anatoly V.: *See*—
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Keaveney, John P.: *See*—
Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.

Kebo, Reynold S., to Hughes Aircraft Company. Infrared afocal zoom telescopecu4,802,717, Cl. 350-1.300.

Kegler, Ernst; Svenka, Konrad; and Thierauf, Klaus, to Siemens Aktiengesellschaft. Write enable ring sensing arrangement for a magnetic tape reelcu4,803,569, Cl. 360-60.000.

Kekesi, Sandor; Tamasi, Piroska; Pal, Veronika; Jancso, Sandor; Kristof nee Szvitil, Ilona; Bacsa, Gyorgy; and Kovacs nee Hadady, Katalin, to Biogal Gyogyszergyar. Composition for the treatment of acnecu4,803,069, Cl. 424-74.000.

Kelly, David L.; and Needham, Jeffrey R., to Burke Company, The; and AMCA International Corp. Eave truss and method for supporting and reinforcing a concrete or masonry wall and metal roof structurecu4,802,316, Cl. 52-90.000.

Kelly, Edmund J., to Sun Microsystems, Inc. Memory access systemcu4,803,621, Cl. 364-200.000.

Kelly, James E.: *See*—
Dickerson, Robert E.; Kelly, James E.; Diehl, Donald R.; and Factor, Ronda E., 4,803,150, Cl. 430-502.000.
Kelner, Gerald. Lightbulb assembly having latching retaining meanscu4,803,396, Cl. 313-318.000.
Kembo, Yukio; Ikeda, Minoru; and Taniguchi, Motoya, to Hitachi, Ltd. X-ray exposure systemcu4,803,712, Cl. 378-034.000.
Kempe, Uwe: *See*—
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Kendale Industries: *See*—
Moranz, Richard F., 4,802,519, Cl. 152-325.000.
Kendall McGraw Laboratories, Inc.: *See*—
Raniere, Jean E.; Smith, Steven L.; Gehrke, Russell P.; and Johnson, Richard E., Jr., 4,803,102, Cl. 428-35.200.
Kendig, John R.; Hibble, William R.; and Kiedrowski, James A., to Honeywell Inc. Magnetic isolating and pointing gimbal apparatuscu4,803,413, Cl. 318-648.000.
Kennedy, Donald E.: *See*—
Barrell, David; Griffith, Gerald P.; Kennedy, Donald E.; and Rollen, Doanld C., 4,803,022, Cl. 264-25.000.
Kennedy, John A., Jr.; and Hansen, Walter, to Dr.-Ing. Rudolf Hell GmbH. Laser diode output power stabilization in a laser imagesettercu4,803,497, Cl. 346-108.000.
Kenney, Andrew C.; Thompson, Philip W.; and Harris, John L., to Oros Systems Limited. Automatic chromatography apparatuscu4,802,981, Cl. 210-198.200.
Kent, John S.: *See*—
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Kent, Stephen B. H.: *See*—
Neurath, Alexander R.; Kent, Stephen B. H.; and Strick, Nathan, 4,803,156, Cl. 435-7.000.
Keppler, Rainer, to Manutec Gesellschaft fur Automatisierungs- und Habungssysteme GmbH. Gantry arrangement for an industrial robotcu4,802,377, Cl. 74-422.000.
Kereszturi, Geza: *See*—
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Kern, Ingo. Storage container for a paint rollercu4,802,576, Cl. 206-225.000.
Kerr-McGee Chemical Corporation: *See*—
Morris, Alan J.; and Coe, Merlin D., 4,803,056, Cl. 422-156.000.
Kerr, Walter B.: *See*—
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Kessler, Harold D., to Haynes International, Inc. Air-annealing method for the production of seamless titanium alloy tubingcu4,802,930, Cl. 148-12.70B.
Kesaoku, Hirobumi: *See*—
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Keyes, Marion A., IV: *See*—
Abromaitis, Andre T.; and Keyes, Marion A., IV, 4,803,052, Cl. 422-91.000.
Keystone Retaining Wall Systems, Inc.: *See*—
Forsberg, Paul J., 4,802,320, Cl. 52-585.000.
KeyTek Instrument Corp.: *See*—
Zugravu, George, 4,803,594, Cl. 361-230.000.
Khan, Mirza M. T.; Bhardwaj, Ramesh C.; and Bhardwaj, Chhaya, to Council of Scientific & Industrial Research. Process for the photocatalytic decomposition of water into hydrogen and oxygencu4,802,963, Cl. 204-157.500.
Khanna, Dinesh N.: *See*—
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Khattab, Mohamed A.: *See*—
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Kida, Katsuaki; Kashihara, Akio; Ishii, Keizou; and Kayano, Hiromichi, to Nippon Paint Co., Ltd. Particles of crosslinked polymer prepared by emulsion polymerization in the absence of dispersion stabilizercu4,803,252, Cl. 526-297.000.
Kidde, Inc.: *See*—
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Kiesewetter, Dieter: *See*—
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Kikuchi, Hiroshi: *See*—
Hirata, Tadashi; Koyama, Katsumi; Takahashi, Hideaki; Harashima, Yasuhiro; Kitahara, Michio; Igarashi, Katsuyuki; Kitamura, Jun; Kikuchi, Hiroshi; and Narisada, Kimiyuki, 4,803,372, Cl. 250-561.000.
Kikuchi, Katsuaki: *See*—
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Kikui, Hitoshi: *See*—
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Kikuta, Shigeru, to Hirose Electric Co., Ltd. Surface mount type electrical connectorcu4,802,860, Cl. 439-79.000.
Kikuta, Yoshikazu: *See*—
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Kikuya, Satoshi: *See*—
Konishi, Akio; Kikuya, Satoshi; Zaitsu, Osamu; and Yoshio, Hideaki, 4,803,574, Cl. 360-85.000.
Kim, Jung Bai: *See*—
Choi, Tai J., 4,802,435, Cl. 114-360.000.
Kim, Sai Hwan: *See*—
Choi, Tai J., 4,802,435, Cl. 114-360.000.
Kimata, Masafumi, to Mitsubishi Denki Kabushiki Kaisha. Elimination of KTC noise in a charge coupled devicecu4,803,709, Cl. 377-58.000.
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Kimbrell, William C., Jr.: *See*—
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Kimura, Kenji: *See*—
Yabe, Hisao; Kimura, Kenji; Kanno, Masahide; Tsuji, Kiyoshi; Yoshinaga, Jun; Yokoi, Takeshi; Ozeki, Kazuhiko; Nishigaki, Shinichi; Nakamura, Takeaki; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,803,550, Cl. 358-98.000.
Kimura, Takashi: *See*—
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King, Chi-Hsin R.: *See*—
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Baldwin, John J.; Ponticello, Gerald S.; Remy, David C.; Claremon, David A.; and King, Stella W., 4,803,286, Cl. 514-431.000.
Kira, Toru; Miyauchi, Teiichi; Nakai, Kiyohito; Shiiba, Kengo; and Yoshikawa, Mitsuhiko, to Sharp Kabushiki Kaisha. Thin film yoketype magnetoresistive headcu4,803,581, Cl. 360-113.000.
Kirchgessner, James A.: *See*—
Alvarez, Antonio R.; and Kirchgessner, James A., 4,803,175, Cl. 437-31.000.
Kirihara, Seishin: *See*—
Usami, Kenichi; Kirihara, Seishin; Morimoto, Tadaoki; Doi, Hiroyuki; and Okada, Michiya, 4,802,894, Cl. 48-77.000.
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Sakakibara, Masayuki; and Nii, Yasushi, 4,803,301, Cl. 562-471.000.
Kirk, Richard A., to Crosfield Electronics Limited. Color video image enhancementcu4,803,548, Cl. 358-36.000.
Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal acylated sulphonylguanidinescu4,802,910, Cl. 71-93.000.
Kisak, James L.: *See*—
Gilmore, Charles B.; Kisak, James L.; Oberst, Jeffrey P.; Wood, John D.; and Baloh, Frank J., 4,803,042, Cl. 376-272.000.
Kishi, Hajimu; Matsui, Mitsuo; and Aramaki, Hitoshi, to Fanuc Ltd. Machine tool for tracer controlled machinery and numerical controlled machinerycu4,803,633, Cl. 364-474.030.
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Kishimoto, Mikio; Nakazumi, Tetsuya; Kawai, Tomoji; and Kawai, Shichio, to Hitachi Maxell, Ltd. Magnetic recording mediumcu4,803,132, Cl. 428-141.000.
Kiso, Osamu: *See*—
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Kitahara, Michio: *See*—
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Kitakado, Ryuji: *See*—
Onishi, Hiroyuki; Sano, Tetsuo; Hoki, Tetsuo; Kodama, Eiji; Tsujinaka, Hisayuki; and Kitakado, Ryuji, 4,803,734, Cl. 382-8.000.

Kitami, Tetsu; Igarashi, Shigeru; and Ono, Katuya, to Yokohama Rubber Co., Ltd., The. Process for producing hosescu4,802,938, Cl. 156-149.000.

Kitamura, Jun: *See*—
Hirata, Tadashi; Koyama, Katsumi; Takahashi, Hideaki; Harashima, Yasuhiro; Kitahara, Michio; Igarashi, Katsuyuki; Kitamura, Jun; Kikuchi, Hiroshi; and Narisada, Kimiyuki, 4,803,372, Cl. 250-561.000.

Kitamura, Kazumi: *See*—
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Kitamura, Satoshi; Tobita, Takashi; Kanazawa, Motoki; and Shiozaki, Masahiro, to Nisso Petrochemical Industries Co., Ltd. Process for producing macrocyclic ester compoundscu4,803,288, Cl. 549-267.000.

Kitano, Mikio: *See*—
Naruse, Kazuo; Kitano, Mikio; and Tobita, Hideaki, 4,802,616, Cl. 228-4.100.

Kitaoh, Katsutoshi, to Sumitomo Rubber Industries, Ltd. Golf ballcu4,802,674, Cl. 273-235.00A.

Kittler, Wilfred C., to Andus Corporation. Surface treatment of polymerscu4,802,967, Cl. 204-192.140.

Kiyoshi, Inoue, to Inoue Japax Research Incorporated. Wire-cut electric discharge machine in which two adjoining segments of a common electrode effect machiningcu4,803,326, Cl. 219-69.00W.

Klashka, John A.; Kaufman, Sidney L.; Kowal, Krzysztof A.; Lewis, Richard P.; Raisbeck, Susan L.; and McNamara, John L., Jr., to Honeywell Bull Inc. Universal peripheral controller self-configuring bootloadable ramwarecu4,803,623, Cl. 364-200.000.

Klees, Garry W., to Boeing Company, The. Plug-type exhaust nozzle having a variable centerbody and translating shroudcu4,802,629, Cl. 239-265.190.

Klink, Jerome P.; and Glaser, Hellmut L, to Owen-Corning Fiberglas Corporation. Glass fiber bulk strand rovingcu4,802,331, Cl. 57-246.000.

Klosterhalfen, Hartwig: *See*—
Ligacz, Herbert; Heimann, Alfred; Klosterhalfen, Hartwig; and Wittkopp, Helmut, 4,802,285, Cl. 33-551.000.

Kluth, Joachim: *See*—
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Knapp, Gunter, to Bodenseewerk Perkin-Elmer & Co., GmbH. Atomic spectrometer apparatuscu4,803,051, Cl. 422-80.000.

Knapton, Edward; and Vincent, Ernest, to Visual Technology Incorporated. Video terminal for use in graphics and alphanumeric applicationscu4,803,476, Cl. 340-750.000.

Knecht, Heinz; and Ackermann, Norbert, to Boge AG. Adjustable shock absorbercu4,802,561, Cl. 188-318.000.

Knight, David John: *See*—
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Fabey, Diana; and Knight, Ernest, Jr., 4,803,163, Cl. 435-68.000.

Knight, May, to Knight, David John. Log cutting machinecu4,802,518, Cl. 144-193.00R.

Knoll, William C.: *See*—
Gouldy, Thomas E.; Knoll, William C.; Ritter, Ernest R., deceased; Lynch, Thomas M.; Steffey, Ronald E.; White, Donald R.; and Brown, Robert E., 4,802,859, Cl. 439-74.000.

Knowles, Jack V. Light weight thermal insulation material product and processcu4,803,107, Cl. 428-68.000.

Koatsu Gas Co., Ltd.: *See*—
Saji, Yoshiro; Tada, Eichi; Toda, Hiroaki; and Kawahara, Yoshiaki, 4,803,452, Cl. 335-301.000.

Kobayashi, Jiro: *See*—
Imamura, Kazunori; Hayano, Fuminori; Kakizaki, Yukio; and Kobayashi, Jiro, 4,803,373, Cl. 250-561.000.

Kobayashi, Masakazu; Harashima, Konomi; and Ariyama, Hiroichi, to Kyowa Vacuum Engineering, Ltd. Method and apparatus for freeze dryingcu4,802,286, Cl. 34-15.000.

Kobayashi, Masaki: *See*—
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Kobayashi, Masao: *See*—
Oh-Kita, Motomu; Kato, Masaaki; and Kobayashi, Masao, 4,803,302, Cl. 562-534.000.

Kobayashi, Masato, to Alps Electric Co., Ltd. Method of molding case for push-button switchcu4,803,030, Cl. 264-278.000.

Kobayashi, Ryoichi: *See*—
Kobori, Shigeyuki; Yamada, Kazuji; Kobayashi, Ryoichi; Miyazaki, Atsushi; and Suzuki, Seikou, 4,802,952, Cl. 156-634.000.

Kobayashi, Satoshi: *See*—
Hara, Seiji; and Kobayashi, Satoshi, 4,803,682, Cl. 371-12.000.

Kobayashi, Tadashi; Suzuki, Katsumi; and Nakamura, Naomasa, to Kabushiki Kaisha Toshiba. Optical recording mediumcu4,803,660, Cl. 365-113.000.

Kobayashi, Toshio, to Asahi Corporation. Toy game apparatuscu4,802,668, Cl. 273-1.0GE.

Kobayashi, Toshio: *See*—
Kushida, Keiko; Takeuchi, Hiroshi; Kobayashi, Toshio; Takagi, Kazumasa; and Susa, Kenzo, 4,803,392, Cl. 310-311.000.

Kobayashi, Yukio; Takeuchi, Masataka; Kameyama, Mutsumi; Ohira, Manabu; Kikuta, Yoshikazu; and Takahashi, Toyohiko, to Showa Denko K.K. & Hitachi, Ltd. Nonaqueous secondary batterycu4,803,138, Cl. 429-194.000.

Kobayashi, Yukio: *See*—
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Kobori, Shigeyuki; Yamada, Kazuji; Kobayashi, Ryoichi; Miyazaki, Atsushi; and Suzuki, Seikou, to Hitachi, Ltd. Method for manufacturing semiconductor absolute pressure sensor unitscu4,802,952, Cl. 156-634.000.

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Kodama, Eiji: *See*—
Onishi, Hiroyuki; Sano, Tetsuo; Hoki, Tetsuo; Kodama, Eiji; Tsujinaka, Hisayuki; and Kitakado, Ryuji, 4,803,734, Cl. 382-8.000.

Kodera, Hiroji, to Kabushiki, Kaisha, Kodera, Denshi, Seisakusho. Automatic wire decorticating and cutting method and apparatuscu4,802,512, Cl. 140-149.000.

Koegi, Rudolph A. A.: *See*—
Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegi, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.

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Koide, Takeharu: *See*—
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Koike, Atsuyoshi; Ikeda, Shuji; and Nagasawa, Kouichi, to Hitachi, Ltd. Semiconductor device sram to prevent out-diffusioncu4,803,534, Cl. 357-71.000.

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Koizumi, Hideaki: *See*—
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Koizumi, Minoru: *See*—
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Koizumi, Takehiro; and Matsuzawa, Hideo, to Shell Oil Company. Lubricating greasecu4,802,999, Cl. 252-18.000.

Koizumi, Tatsuya: *See*—
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Kojima, Katsumi; and Miki, Ryota, to Nippon Air Brake Co., Ltd. Braking force holding device for an air brake systemcu4,802,563, Cl. 192-13.00A.

Kojimoto, Susumu; Nii, Fumio; and Mori, Toshio, to Sumitiomo Chemical Company, Limited. Coated seedscu4,802,305, Cl. 47-57.600.

Komatsu, Hiroshi, to Nissan Motor Co., Ltd. Compact turbine housingcu4,802,820, Cl. 415-201.000.

Komatsu, Hirotake, to Nippon Gakki Seizo Kabushiki Kaisha; and Komatsu, Hirotake. High speed, low power consumption pickup head position control device in an optical type disc reproducing devicecu4,803,675, Cl. 369-32.000.

Komatsu, Koichi: *See*—
Mukai, Masato; and Komatsu, Koichi, 4,802,269, Cl. 29-149.50C.

Komatsu, Shigeru. Dental implantcu4,802,847, Cl. 433-176.000.

Komatsu, Yasuhiro, to Hosiden Electronics Co., Ltd. Pin plug with an optical fibercu4,802,728, Cl. 350-96.200.

Komatsu Zenoah Co.: *See*—
Matsunaga, Takao; Nakajima, Kazuo; and Kobayashi, Masaki, 4,802,555, Cl. 184-15.100.

Komatsuzaki, Shigeki: *See*—
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Komura, Akihiko: *See*—
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Kondo, Hitoshi; Sasaki, Makoto; and Kobayashi, Yukio, to Bridgestone Corporation; and Nippon Oil Co., Ltd. Rubber compositionscu4,803,248, Cl. 525-211.000.
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Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,803,518, Cl. 355-4.000.
Hiratsuka, Seiichiro; Haneda, Satoshi; and Shoji, Hisashi, 4,803,514, Cl. 355-4.000.
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Kono, Yoshitsugu: *See*—
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Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft mbH & CO. KG: *See*—
Meinl, Bernd, 4,802,416, Cl. 104-192.000.
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Kopatz, Nelson E.; Ritsko, Joseph E.; and Johnson, Walter A., to GTE Products Corporation. Process for producing finely divided spherical metal powders containing an iron group metal and a readily oxidizable metalcu4,802,915, Cl. 75-0.5AA.
Korant, Bruce D.: *See*—
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Koschorrek, Max. Method of making webs, mats and the like of reed-like plastic straws for thatched roofcu4,802,941, Cl. 156-244.180.
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Kouda, Toyomasa, to Hitachi, Ltd. Semiconductor devicecu4,803,541, Cl. 357-68.000.
Kourogi, Isao; Masuda, Keiichi; Hirooka, Masami; Tomiyama, Yoshio; Yoshiuchi, Kazunori; and Gokenya, Takashi, to Kubota Ltd. Device for attaching front loader to tractorcu4,802,814, Cl. 414-686.000.
Kovac, Andrew J. Amphibious vehiclecu4,802,433, Cl. 114-270.000.
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Koyama, Motoyasu; Teraoka, Hidetoshi; Akagi, Takao; Yamaguchi, Shinji; Sakamoto, Itsuki; Namba, Akira; and Okagaki, Isao, to Kuraray Co., Ltd. Apparatus for plasma treatment of a sheet-like structurecu4,803,332, Cl. 219-121.520.
Koyama, Osamu, to Canon Kabushiki Kaisha. Magneto-optical information reproducing apparatus in which divided reproducing lights are differentially detected by a photodetector having no amplifying action through an analyzer whose transmission axis azimuth is optimizedcu4,803,579, Cl. 360-114.000.
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Kraus, Rainer; Kowarik, Oskar; and Paul, Manfred, to Siemens Aktiengesellschaft. Digital amplifier configuration in integrated circuitscu4,803,386, Cl. 307-530.000.
Krause, Richard J.; Lee, Jaw F.; and Breckenridge, Craig W., to Bio-Chem Technology. Optical probe mounting devicecu4,803,365, Cl. 250-461.200.
Kresge, Edward N.; and Hazelton, Donald R., to Exxon Chemical Patents Inc. Method for making composite filmscu4,803,035, Cl. 264-519.000.
Kresge, James S.; and Zaks, Gordon E., to General Electric Company. Method and apparatus for evaluating the condition of a gapless metal-oxide varistor lightning arrester used for protecting a distribution transformercu4,803,436, Cl. 324-549.000.
Kretow, Robert P.; and Powers, John W., to Essex Specialty Products, Inc. Reinforcing sheet for the reinforcement of panel and method of reinforcing panelcu4,803,105, Cl. 428-40.000.
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Krijnen, Wilhelmus J.; Roest, Jacob B.; and Bloemheuvel, Jacob, to Shell Oil Company. Process for the preparation of a polysaccharide in oil dispersion and dispersion obtained therebycu4,803,264, Cl. 536-114.000.
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Kronseder, Hermann. Glue applicator for labeling machinescu4,802,440, Cl. 118-261.000.
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Kubota Ltd.: *See—*
Kourogi, Isao; Masuda, Keiichi; Hirooka, Masami; Tomiyama, Yoshio; Yoshiuchi, Kazunori; and Gokenya, Takashi, 4,802,814, Cl. 414-686.000.

Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galian, Boris A.; and Zelensky, Vladimir F., to Institut Elektrosvarki Imeni E.O. Patona Akademii Nak Ukrainskoi. Machine for flash butt welding of pipescu4,803,330, Cl. 219-97.000.

Kuczynski, Robert A. Automatic and manually resettable miniaturized circuit breakercu4,803,455, Cl. 337-68.000.

Kudo, Yoshihiko: *See—*
Aoki, Haruo; and Kudo, Yoshihiko, 4,802,966, Cl. 204-182.400.

Kuehl, Ulrich: *See—*
Ohlendorf, Heinrich-Wilhelm; Kaupmann, Wilhelm; Kuehl, Ulrich; Buschmann, Gerd; and Magda, Stephen J., 4,803,198, Cl. 514-212.000.

Kugimiya, Haruo: *See—*
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,803,361, Cl. 250-227.000.

Kuhle, Walter: *See—*
Decker, Heinz; Engfer, Ortwin; and Kuhle, Walter, 4,802,648, Cl. 248-550.000.

Kuhn, Hans H.; and Kimbrell, William C., Jr., to Milliken Research Corporation. Electrically conductive textile materials and method for making samecu4,803,096, Cl. 427-121.000.

Kuhn, Reinhard: *See—*
Bte, Ulrich, ml/u/ hler; Tappe, Horst; Kuhn, Reinhard; Bode, Albert; and Boss, Margareta, 4,802,889, Cl. 8-639.000.

Kuhn, Timothy J.; Bender, James W.; and Thekdi, Arvind C., to Gas Research Institute. High capacity, retractable furnace hearthcu4,802,844, Cl. 432-126.000.

Kuker, Wolfgang; Braemert, Peter; and Ortmann, Werner, to Linke-Hofmann-Busch GmbH. Gangway for a railway car passagewaycu4,802,417, Cl. 105-8.100.

Kukes, Simon G.; and Smith, Clifford E., to Phillips Petroleum Company. Extraction of metals from aqueous solutions with asphaltenescu4,802,920, Cl. 75-118.00R.

Kukes, Simon G.; and Howell, Jerald A., to Phillips Petroleum Company. Hydrofining of oilscu4,802,972, Cl. 208-107.000.

Kukes, Simon G.; and Harris, Jesse R., to Phillips Petroleum Company. Hydrofining employing treated alumina material in fixed bedcu4,802,974, Cl. 208-217.000.

Kuklinski, Anthony K. Saber saw bladecu4,802,396, Cl. 83-849.000.

Kulp, George R., to Fischer & Porter Company. Cursor control matrix for computer graphicscu4,803,474, Cl. 340-709.000.

Kulpa, Charles F.; and Johnston, Michael G., to Occidental Chemical Corporation. Microorganism for degrading toxic waste materialscu4,803,166, Cl. 435-253.300.

Kumahora, Hiroki; Hashimoto, Tsuneyuki; and Nishimura, Eiichi, to Hitachi, Ltd. Method and apparatus for measuring degree of vacuum in an electron microscopecu4,803,356, Cl. 250-306.000.

Kumasaka, Noriyuki; Otomo, Shigekazu; Yamashita, Takeo; Zama, Hideo; and Morikawa, Juichi, to Hitachi, Ltd. Magnetic head having improved track width narrowing groovescu4,803,338, Cl. 360-122.000.

Kung, Hsing: *See—*
Scifres, Donald R.; Kung, Hsing; Cross, Peter; Burnham, Robert D.; and Streifer, William, 4,803,691, Cl. 372-150.000.

Kung, Patrick C.; and Goldstein, Gideon, to Ortho Pharmaceutical Corporation. Hybrid cell line for producing monoclonal antibody to human cytotoxic and suppressor T cells, antibody, and methodscu4,803,262, Cl. 530-387.000.

Kunkel, Robert W.: *See—*
Stautzenberger, A. Lee; and Kunkel, Robert W., 4,803,295, Cl. 560-78.000.

Kuno, Mitsutoshi: *See—*
Shindo, Hitoshi; Enari, Masahiko; and Kuno, Mitsutoshi, 4,802,744, Cl. 350-339.00F.

Kunz, Rene, to Alphasem Corporation. Bonding semiconductor chips to a mounting surface utilizing adhesive applied in starfish patternscu4,803,124, Cl. 428-200.000.

Kupfer, Karl-Heinz O., to U.S. Philips Corporation. Low-pass filter for limiting the frequency band of a luminance signalcu4,803,549, Cl. 358-39.000.

Kurano, Akira: *See—*
Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, 4,803,572, Cl. 360-60.000.

Kuraray Co., Ltd.: *See—*
Koyama, Motoyasu; Teraoka, Hidetoshi; Akagi, Takao; Yamaguchi, Shinji; Sakamoto, Itsuki; Namba, Akira; and Okagaki, Isao, 4,803,332, Cl. 219-121.520.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Aoki, Haruo; and Kudo, Yoshihiko, 4,802,966, Cl. 204-182.400.

Kures, Vasek J.: *See—*
Chapdelaine, Albert H.; Kures, Vasek J.; and Grey, Ronald T., 4,803,083, Cl. 426-3.000.

Kurland, Heinrich: *See—*
Schaper, Helmut; and Kurland, Heinrich, 4,802,925, Cl. 127-19.000.

Kuron Corporation: *See—*
Tsuchida, Eiharu; and Nagasawa, Hisayoshi, 4,802,521, Cl. 160-172.000.

Kurosaki, Tomihiro: *See—*
Ogino, Hidekazu; Kamitani, Hiroshi; Kamegai, Jun; Sawada, Hiroki; Hirota, Hajime; and Kurosaki, Tomihiro, 4,803,010, Cl. 252-174.210.

Kurosawa, Kazuhito: *See—*
Hikita, Mitsutaka; Saigo, Yoichi; and Kurosawa, Kazuhito, 4,803,449, Cl. 333-193.000.

Kuroyanagi, Masatoshi; Matsui, Kazuma; Majima, Youzou; and Murakami, Fumiaki, to Nippondenso Co., Ltd. Electronically controlled braking system without a master cylindercu4,802,562, Cl. 192-1.230.

Kurtovic, Zlatko: *See—*
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Kurz, Leonard: *See—*
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Kushibiki, Nobuo: *See—*
Baba, Takeshi; Suda, Shigeyuki; Nose, Noriyuki; Kawakami, Eigo; Nakajima, Toshiyuki; and Kushibiki, Nobuo, 4,802,746, Cl. 350-418.000.

Kushida, Keiko; Takeuchi, Hiroshi; Kobayashi, Toshio; Takagi, Kazumasa; and Susa, Kenzo, to Hitachi, Ltd. Piezoelectric transducercu4,803,392, Cl. 310-311.000.

Kussendrager, Klaas D.; van den Biggelaar, Henricus A. M.; and Vromans, Herman, to DMV-Campina B.V. Spray dried lactose and process for preparing the samecu4,802,926, Cl. 127-31.000.

Kuster, Hans-Werner; Schwarzenberg, Norbert; and Vanaschen, Luc, to Saint-Gobain Vitrage. Method and apparatus for curving a glass sheetcu4,802,903, Cl. 65-106.000.

Kusunoki, Masahiro: *See—*
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Kuwabara, Ken-ichi: *See—*
Takahashi, Toshiro; Kuwabara, Ken-ichi; and Okada, Masahiro, 4,803,149, Cl. 430-264.000.

Kuwakado, Satosi: *See—*
Onimaru, Sadahisa; Shimogawa, Toshiaki; Taguchi, Masahiro; and Kuwakado, Satosi, 4,802,706, Cl. 296-68.000.

Kuwata, Sinichi; Katoh, Hiromasa; and Ono, Mitsumasa, to Mitsubishi Chemical Industries Limited. Method for measuring the water content of a solid sample using Karl Fischer's coulometric titrationcu4,802,957, Cl. 204-1.00T.

Kwong, Sze-Keung: *See—*
Kyuma, Kazuo; Kwong, Sze-Keung; and Yariv, Amnon, 4,803,429, Cl. 324-244.000.

Kyowa Vacuum Engineering, Ltd.: *See—*
Kobayashi, Masakazu; Harashima, Konomi; and Ariyama, Hiroichi, 4,802,286, Cl. 34-15.000.

Kyselica, Stefan P.: *See—*
Lawrence, Glen S.; Haynie, Timothy J.; Ferrario, Joseph D.; and Kyselica, Stefan P., 4,803,333, Cl. 219-121.130.

Kyuma, Kazuo; Kwong, Sze-Keung; and Yariv, Amnon, to California Institute of Technology. Recovering polarization of light of arbitrary polarization propagating through distoring medium by phase conjugation reflection back through said mediumcu4,803,429, Cl. 324-244.000.

La Telemecanique Electrique: *See—*
Fournier, Bernard; Contal, Maurice; and Vergez, Andre , 4,803,587, Cl. 361-24.000.

Labworks, Inc.: *See—*
Butts, Gary C., 4,803,362, Cl. 250-229.000.

Lafleur, Jean-Claude. Panel structure for garage doors and the likecu4,802,319, Cl. 52-455.000.

Lageder, Heinrich; Masek, Jaroslav; and Prochazka, Kamil, to BBC Brown, Boveri & Company, Ltd. Return mechanism of an actuating drivecu4,802,403, Cl. 91-374.000.

Lagow, Richard J.: *See—*
Juhlke, Timothy J.; Bierschenk, Thomas R.; and Lagow, Richard J., 4,803,005, Cl. 252-58.000.

Lahndorff, Kendell S.; and Bewley, Wilbur C., Jr., to Whirlpool Corporation. Anti-cord swallowing system and method for a floor cleanercu4,802,254, Cl. 15-41.00R.

Laido, Michael. Storage and transport containers for heavy and/or fragile objectscu4,802,619, Cl. 229-125.190.

L'Air Liquide: *See—*
Politi, Jean-Marie, 4,802,504, Cl. 137-454.500.

Land Paving Company: *See—*
Dombrowski, Anthony E., 4,803,488, Cl. 340-904.000.

Landes, Marie-Paule: *See—*
Combourieu, Michel; Simbille, Nadine; Landes, Marie-Paule; and Bernet, Yvon, 4,803,219, Cl. 514-469.000.

Landstingens inkopscentral LIC, ekonomisk forening: *See—*
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Lang, Thomas G. Planing catamaran vesselcu4,802,428, Cl. 114-61.000.

Langdale, Wayne A.: *See—*
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Lantos, Ivan: *See—*
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LaPiana, John. Device for removing putty from a windowcu4,802,280, Cl. 30-293.000.

LaPlante, Jerry C.: *See—*
Wilson, Robert; and LaPlante, Jerry C., 4,802,436, Cl. 164-440.000.

Laporte, Jean-Claude: *See—*
Descos, Rene; and Laporte, Jean-Claude, 4,802,676, Cl. 273-363.000.

Lars-Jos, Pehr. Garment of chain armour structurecu4,802,242, Cl. 2-2.000.

Larsen, Arild, to AB Tetra Pak. Arrangement for the feeding of sheets to a magazinecu4,802,664, Cl. 271-201.000.

Larson, David B.; and Nelson, Erik B., to Dowell Schlumberger Incorporated. Method and device for manipulating ferrofluids for use in cementing wellscu4,802,534, Cl. 166-381.000.

Laster, Pat. Tree cutting apparatuscu4,802,517, Cl. 144-34.00E.

Latka, Franz: *See*—
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Lauber, Michael L., to Firestone Tire & Rubber Company, The. Autolubercu4,802,556, Cl. 184-102.000.

Laughlin, Patrick E. CPR maskcu4,802,857, Cl. 434-265.000.

Laurence, Brian R.; and Pickett, John A., to National Research Development Corp. Pheromonescu4,803,289, Cl. 549-273.000.

Laverty, Martin J., Jr., to Coyne & Delany Co. Disabler and activation system for plumbing fixturecu4,802,246, Cl. 4-427.000.

Law, Kam W.; and Goethel, Walter W., to Minnesota Mining and Manufacturing Company. Modified resins and abrasive articles made with the same as a bond systemcu4,802,896, Cl. 51-298.000.

Lawandy, Nabil M. Ordered colloidal suspension optical devicescu4,803,688, Cl. 372-21.000.

Lawrence, Glen S.; Haynie, Timothy J.; Ferrario, Joseph D.; and Kyselica, Stefan P., to Ferranti Scisky, Inc. Viewing optics for external-mount electron beam welderscu4,803,333, Cl. 219-121.130.

Lawson, Timothy J.: *See*—
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Laxo, Darryl E., to Chevron Research Company. Automatic, gravity-powered closure devicecu4,802,306, Cl. 49-31.000.

Leason, Jack M.: *See*—
Mueller, Peter W.; and Leason, Jack M., 4,803,481, Cl. 340-825.500.

Lecrivain, Jean-Paul: *See*—
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Lee, Chin-Sheng: *See*—
Chen, Shun; and Lee, Chin-Sheng, 4,802,679, Cl. 277-12.000.

Lee, Chun-Sheu; and Ream, Stanley L., to Amada Company, Limited. Laser resonatorcu4,803,694, Cl. 372-98.000.

Lee, Duck H. Tag attaching apparatuscu4,802,615, Cl. 227-67.000.

Lee, Edward: *See*—
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Lee, Jaw F.: *See*—
Krause, Richard J.; Lee, Jaw F.; and Breckenridge, Craig W., 4,803,365, Cl. 250-461.200.

Lee, Noel. Universal electrical connectorcu4,802,870, Cl. 439-860.000.

Lee, Ving J.; and Curran, William V., to American Cyanamid Company. Substituted 1,2,3-thia-diazole-4-thiolatescu4,803,280, Cl. 548-127.000.

Lee, W. David: *See*—
McFadden, David H.; and Lee, W. David, 4,802,459, Cl. 126-41.00R.

Leers, Dieter: *See*—
Bachmann, Peter K.; Geittner, Peter E. E.; Leers, Dieter; and Wilson, Howard J. C., 4,802,733, Cl. 350-96.340.

Leest, Yvo F. H.: *See*—
Peigneur, Paul G. L.; Leest, Yvo F. H.; and Van Beersel, Jozef F. L., 4,803,104, Cl. 428-35.100.

Lefebvre, Jean-Claude, to ITT Composants Et Instruments. Axial load resistant key switchcu4,803,321, Cl. 200-517.000.

Lefevre, Daniel: *See*—
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Lefevre, Marcel R.; and Smith, Marven M., II, to Lefevre, Marcel R. Splash fill for heat and mass transfer apparatus and method of making a splash fill assemblycu4,803,018, Cl. 261-111.000.

Lehmann, Rudiger: *See*—
Uhde, Dietmar; Gleim, Gunter; Schandl, Hartmut; Hoch, Peter; and Lehmann, Rudiger, 4,803,408, Cl. 318-254.000.

Lehner, Gerald J.: *See*—
Burke, Michael J.; Pidsosny, Richard A.; and Lehner, Gerald J., 4,803,646, Cl. 364-561.000.

Leib, Kenneth G.; and Jue, Suey L., deceased (by Jue, Catherine, executrix), to Grumman Aerospace Corporation. One piece frame for holding a holographic element in a holographic systemcu4,802,718, Cl. 350-3.600.

Leichle, Roland G.; and Lecrivain, Jean-Paul. Door bath tube for the handicappedcu4,802,247, Cl. 4-556.000.

Leistner, Jack W.: *See*—
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Lemke, James U.: *See*—
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Lenhart, Armin; and Hub, Karl-Rupprecht, to Siemens Aktiengesellschaft. Disc-shaped carrier body for a recording medium and method for manufacturing samecu4,803,106, Cl. 428-64.000.

Leonhardy GmbH: *See*—
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Les Fils D'Auguste Maillefer Societe Anonyme A Ballaigues: *See*—
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Lessmann, Gerald G.: *See*—
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Leuchten, William E.; and Kretow, Robert P., to Essex Specialty Products, Inc. Honeycomb reinforcing sheet for the reinforcement of panels and method of reinforcing panelscu4,803,108, Cl. 428-118.000.

Leung, Paul C. P.: *See*—
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Levenson, Corey H.; and Mullis, Kary B., to Cetus Corporation. Carbamic acid ester useful for preparing a nucleic acid probecu4,803,297, Cl. 560-159.000.

Levine, Joseph E.: *See*—
Ahn, Kie Y.; Basavaiah, Saryadevara; Brodsky, Stephen B.; Cortellino, Charles A.; and Levine, Joseph E., 4,803,110, Cl. 428-137.000.

Levine, Stephen N.; Puhl, Larry C.; Bliss, Harry M.; and Corrigan, Gerald E., to Motorola, Inc. Bit synchronization method for a digital radio telephone systemcu4,803,726, Cl. 380-48.000.

Levinson, Arthur D.: *See*—
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Levityansky, Ivan A.: *See*—
Bozhko, Valery P.; Losev, Alexei V.; Takoriants, Mateos P.; Pleshkov, Viktor I.; Strizhenko, Vitaly E.; Levityansky, Ivan A.; Filippov, Boris L.; and Kononenko, Tamara I., 4,802,654, Cl. 266-51.000.

Lew, Hyok S.; and Lew, Yon S. Ball plug valvecu4,802,651, Cl. 251-161.000.

Lew, Yon S.: *See*—
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Lewis, Adam J.; and Frensley, William R., to Texas Instruments Incorporated. Infrared detector system based upon group III-V epitaxial materialcu4,803,537, Cl. 357-30.000.

Lewis, Richard P.: *See*—
Klashka, John A.; Kaufman, Sidney L.; Kowal, Krzysztof A.; Lewis, Richard P.; Raisbeck, Susan L.; and McNamara, John L., Jr., 4,803,623, Cl. 364-200.000.

Leybold-Heraeus GmbH: *See*—
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Lhospice, Bernard, to Essilor International Cie Generale d'Optique. Eyeglass frame with resilient bridgecu4,802,753, Cl. 351-88.000.

Li-Cor, Inc.: *See*—
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Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., to Allied-Signal Inc. Apparatus for texturizing yarncu4,802,268, Cl. 28-254.000.

Libe', Giorgio: *See*—
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Liburdi Engineering Limited: *See*—
Hakim, M. Javid, 4,803,127, Cl. 428-457.000.

Lien, Larry A., to Desalination Systems, Inc. Spiral-wound membrane with improved permeate carriercu4,802,982, Cl. 210-247.000.

Ligacz, Herbert; Heimann, Alfred; Klosterhalfen, Hartwig; and Wittkopp, Helmut, to Wilhelm Hegenscheidt GmbH. Method and apparatus for ascertaining the radial location of a new wheel profile to be produced by a reprofiling operationcu4,802,285, Cl. 33-551.000.

Light, Ronald R., to Eastman Kodak Company. Reinforced polyester molding compositionscu4,803,237, Cl. 524-385.000.

Liland, Alfred L.: *See*—
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Lin, Jiang-Jen: *See*—
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Lin, Li-Ling: *See*—
Chen, Ming-Hui, 4,803,670, Cl. 367-99.000.

Lin, Mei-Jan L.: *See*—
Mouche , Richard J.; and Lin, Mei-Jan L., 4,802,994, Cl. 210-759.000.
Mouche', Richard J.; and Lin, Mei-Jan L., 4,802,996, Cl. 210-764.000.

Lindgren, Anders, to Siemens Aktiengesellschaft. Heart pacemaker for avoiding pacemaker mediated tachycardia at mode switchingcu4,802,483, Cl. 128-419.0PG.

Lindsey, Russell E., to Scott Manufacturing, Inc. Module builder back door latchcu4,802,604, Cl. 220-324.000.

Lindskog, Kjell; and Sandegard, Jan, to Procare AB. Device for teaching treatment of skeleton injuriescu4,802,858, Cl. 434-274.000.

Linke-Hofmann-Busch GmbH: *See*—
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Linsley, Peter S.; Ochs, Vincent W.; Horn, Diane; Brown, Joseph P.; Ring, David B.; and Frankel, Arthur E., to Cetus Corporation. Assay for human breast cancercu4,803,169, Cl. 435-7.000.

Lipner, Melvin H.: *See*—
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Lipp, Alfred: *See*—
Schwetz, Karl-Alexander; Grellner, Wolfgang; Hunold, Klaus; Mohr, Max; and Lipp, Alfred, 4,803,183, Cl. 501-96.000.

Lipsztajn, Marek, to Tenneco Canada Inc. Electrosynthesis of persulfatecu4,802,959, Cl. 204-82.000.

Lisack, Dennis. Umbrella with pistol-shaped handle and trigger-activated opening devicecu4,802,499, Cl. 135-24.000.

Lisonic Electronic Co. Ltd.: *See*—
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Livingston, Andrew D.: *See*—
Shinn, Donald E.; and Livingston, Andrew D., 4,802,288, Cl. 34-136.000.
Livingston, Mark L.; and Babcock, Michael. Portable cooler for beverage kegscu4,802,344, Cl. 62-372.000.
Loggy Bayou Industries: *See*—
Williams, Ralph D., 4,802,552, Cl. 182-187.000.
Lohrey, David W.; and Danel, Alexander R. Automated customer interface for services involving drop-off and pickupcu4,803,348, Cl. 235-381.000.
Long, D. Clayton, to MacGregor Golf Company. Set of golf ironscu4,802,672, Cl. 273-77.00A.
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., to UOP. Conversion of crude oil feedscu4,803,184, Cl. 502-63.000.
Longman, Robert J.: *See*—
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Lorber, Kurt. Device for clipping papercu4,802,263, Cl. 24-67.500.
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Jacquet, Bernard; Hocquaux, Michel; Semeria, Didier; and Saint-Leger, Didier, 4,803,228, Cl. 514-714.000.
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Loughran, James A.: *See*—
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Lower, William E.; McCauley, W. Nash; Mitchell, Stephen C.; Robins, Roger C.; and Schmidt, Steven A., to Rotex, Inc. Louvered chip screenercu4,802,591, Cl. 209-680.000.
LTV A&D Sierra Research Division: *See*—
Giori, Francis A., 4,803,489, Cl. 342-192.000.
Luberne, Patricia: *See*—
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Lubrizol Genetics, Inc.: *See*—
Appelbaum, Edward R., 4,803,165, Cl. 435-172.300.
Lucas Industries Public Limited Company: *See*—
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Luchaco, David G.: *See*—
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Lueken, Jeffrey A. Stereo mixing jackcu4,803,728, Cl. 381-25.000.
Lueneburger, Klaus, to Siemens Aktiengesellschaft. Technique for calibrating an electromagnetic relaycu4,803,451, Cl. 335-273.000.
Lundeen, Merle E.; and Sewell, Wesley C., to Honeywell Inc. Dither signal remover for a dithered ring laser angular rate sensorcu4,802,766, Cl. 356-350.000.
Lupoli, Peter J.; and Mattis, Donald J., to Casco Products Corporation. Electric switch constructioncu4,803,320, Cl. 200-342.000.
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Jacoby, Elliot G., Jr.; D'Aleo, Michael J.; Luchaco, David G.; Spira, Joel S.; Wagner, Richard A.; Yuhasz, Stephen J.; and Dowler, David H., 4,803,380, Cl. 307-157.000.
Lymburner, Robert K. Proximity switch for a cylindercu4,803,318, Cl. 200-82.00R.
Lynch, Robert P., to Lyntech Corporation. Reel type marine pipe laying apparatus with tension induced pipe straightening cu4,802,794, Cl. 405-168.000.
Lynch, Thomas M.: *See*—
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Lyons, Dale R.; Wills, David C.; and Heys, George, Jr., to NCR Corporation. Theft proof cash drawer assemblycu4,803,346, Cl. 235-7.00R.
Lyons, James E.; Ellis, Paul E., Jr.; Myers, Harry K., Jr.; Suld, George; and Langdale, Wayne A., to Sun Refining and Marketing Company. Alkane oxidation catalystscu4,803,187, Cl. 502-200.000.
MacGregor Golf Company: *See*—
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Moret, Willem, 4,803,034, Cl. 264-504.000.
Mack, Daniel R., to Sequoia-Turner Corporation. Method and apparatus for liquid addition and aspiration in automated immunoassay techniquescu4,803,050, Cl. 422-65.000.
Mackenzie, Kenneth A.: *See*—
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Macnak, Philip P.: *See*—
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Mader, Karl; Schonenberger, Guido; and Buzzi, Carlo A., to I D C - Chemie AG. Method for treating portions of the human bodycu4,802,480, Cl. 128-400.000.
Maeda, Eiji: *See*—
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Maeda, Masahiko, to Mita Industrial Co., Ltd. Copying machine having removable process unit in a housingcu4,803,510, Cl. 355-3.00R.
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Maeno, Hiroshi; and Tamamura, Hideo, to Canon Kabushiki Kaisha. Waterproof cameracu4,803,504, Cl. 354-64.000.
Maesaka, Michinobu: *See*—
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Maeser, Ward W.: *See*—
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Maeser, William C.; and Maeser, Ward W. Portable transceivercu4,803,652, Cl. 364-708.000.
Maganias, Nicholas H. Device and method for allergy testingcu4,802,493, Cl. 128-743.000.
Magarinos, Jose; and Coleman, Daniel, to Farrand Optical Co. Infrared laser shieldcu4,802,719, Cl. 350-3.650.
Magatti, Charles V.; and Doll, Ronald J., to Schering Corporation. Antihypertensive acylpyrazinescu4,803,206, Cl. 514-255.000.
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Magnetic Peripherals Inc.: *See*—
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Maier-Laxhuber, Peter; and Kaubek, Fritz. Adsorption apparatus test as an electro-heating storagecu4,802,341, Cl. 62-235.100.
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Malashenko, Alexander, to Valmet-Dominion Inc. Forming board for papermaking machinecu4,802,954, Cl. 162-348.000.
Malmquist, Richard G., to Computervision Corporation. Electromagnetic shielding clipcu4,803,306, Cl. 174-35.0GC.
Mamantov, Gleb, to Du Pont de Nemours, E. I., and Company. Process for preparing fluorine by electrolysis of calcium fluoridecu4,802,970, Cl. 204-60.000.
MAN-Roland Druckmaschinen Aktiengesellschaft: *See*—
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Mandl, William J., to Aerojet-General Corporation. Low power eprom logic cell and logic arrays thereofcu4,803,661, Cl. 365-184.000.
Mangiarotty, Rudolph A., to Boeing Company, The. Control of laminar flow in fluids by means of acoustic energycu4,802,642, Cl. 244-200.000.
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Mansell, William T., to Chadwick Industries Pty. Limited. Membrane roofing systemcu4,803,111, Cl. 428-139.000.
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Marconi Electronic Devices Limited: *See*—
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Margolies, Michael: *See—*
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Marin, Carlo; and Seveso, Cesare, to Societaa Cavi Pirelli S.p.A. Electrical cable with open helix screen wires electrically contacting a longitudinal wire and manufacture thereofcu4,803,309, Cl. 174-106.00R.
Marin, Roger A., to Xantech Corporation. Vertical blanking interval standardizer circuitcu4,803,552, Cl. 358-148.000.
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Marmor, Adrian. Bedclothing supportcu4,802,252, Cl. 5-505.000.
Marohl, Rudolph O.: *See—*
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Martinez, Mario J., to Elgin Sweeper Company. Central rotating terminal for vehiclescu4,802,549, Cl. 180-322.000.
Maruhashi, Yoshitsugu; Iida, Setsuko; Sugisaki, Takashi; Mizutani, Yohji; and Kishida, Nobuhiro, to Toyo Seikan Kaisha, Ltd. Process for blow-molding and heat setting of polyester hollow formed bodycu4,803,036, Cl. 264-526.000.
Marui, Kuniyoshi, to Kabushiki Kaisha Toshiba. Automatic answering telephone with memory storage having storage indication and an alarmcu4,803,717, Cl. 379-67.000.
Maruska, Gerald F. Method and apparatus for renewing cutting edges in corn processing equipmentcu4,802,495, Cl. 130-9.00B.
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Neef, Heinz, 4,802,754, Cl. 351-138.000.
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Maschek, Martin; Mastner, Georg; and Tomic, Branko, to BBC Brown Boveri AG. Optical waveguide arrangement for a high-voltage insulatorcu4,802,731, Cl. 350-96.230.
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Mase, Toshiyasu; Tsuzuki, Ryuji; Hara, Hiromu; Murase, Kiyoshi; and Tomioka, Kenichi, to Yamanouchi Pharmaceutical Co., Ltd. Thiadizazole compounds as antagonists of SRS-Acu4,803,211, Cl. 514-361.000.
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Mason, Howard C. Method of constructing laminated panelscu4,802,946, Cl. 156-264.000.
Mason, Roy G.; and Andreasen, Leif, to Amcon, Inc. Precision measuring gauge having sonic delay line with free-standing mode converter armaturecu4,803,427, Cl. 324-207.000.
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Masuda, Yoshio, to Fukada, Hideaki, a part interest. Continuous mining device for crust deposits, etc. and continuous line bucket method with turning movementcu4,802,292, Cl. 37-69.000.
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Masuoka, Fujio, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrically erasable and electrically programmable read only memorycu4,803,529, Cl. 357-23.500.
Matesco, Michel, to Eyquem. Process for the manufacture of a platinum-tipped bimetallic central electrode for an ignition plug and the electrode produced according to this processcu4,803,395, Cl. 313-141.000.
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Matsumoto, Goro; and Shimizu, Koichi, to Matsumoto, Goro; and Hitachi Medical Corporation. Three-dimensional shape measuring apparatuscu4,802,759, Cl. 356-376.000.
Matsumoto, Kazuyoshi; Miyakawa, Seiichi; Ohdake, Eishu; and Suzuki, Shigeru, to Ricoh Company, Ltd. Flat solid discharging devicecu4,803,593, Cl. 361-225.000.
Matsumoto, Yoshimichi: *See—*
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Matsumura, Hiroyoshi: *See—*
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Matsunaga, Takao; Nakajima, Kazuo; and Kobayashi, Masaki, to Komatsu Zenoah Co. Oil supply systemcu4,802,555, Cl. 184-15.100.
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Matsushita, Eiji, to Hochiki Corporation. Fire alarm systemcu4,803,469, Cl. 340-577.000.
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Maue, H. Winston, to United Technologies Automotive, Inc. Probeable electrical connectorcu4,802,869, Cl. 439-587.000.
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McBain, Robert M.; Becze, Garry J.; Kruppert, Friedrich W.; and Leistner, Jack W., to Algoma Steel Corporation, Limited, The. Pipe quenching apparatuscu4,803,037, Cl. 266-78.000.
McBride, John J., to Montefiore Hospital Association of Western Pennsylvania, Inc. Method and apparatus for shimming tubular supermagnetscu4,803,433, Cl. 324-318.000.
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McFadden, David H.; and Lee, W. David, to Gas Research Institute. Improved gas oven using flame switchingcu4,802,459, Cl. 126-41.00R.
McGinnis, Francis K., III; and Enright, John F., III, to Nass, Inc. Furnace for hazardous materialscu4,802,424, Cl. 110-250.000.
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Medley, Frank W., III. Fluid filter having separable elements and removable end closurescu4,802,979, Cl. 210-132.000.
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Meinl, Bernd, to Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft mbH & CO. KG. Cableway having a multipass lift cablecu4,802,416, Cl. 104-192.000.
Meisenburg, Ewald: *See*—
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Menchetti, Robert J., to National Gypsum Company. Sag resistant ceiling panelcu4,802,321, Cl. 52-484.000.
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Baldwin, John J.; Ponticello, Gerald S.; Remy, David C.; Claremon, David A.; and King, Stella W., 4,803,286, Cl. 514-431.000.
Schwartz, Robert E.; Hirsch, Charles F.; Sigmund, Janet M.; and Pettibone, Douglas J., 4,803,217, Cl. 514-409.000.
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Bernard, Georges; Bouvet, Bernard; Jacolin, Richard; Colleoni, Guido; Gaillard, Jacques; and Volsy, Robert, 4,803,319, Cl. 200-147.00A.
Merrell Dow Pharmaceuticals Inc.: *See*—
Jones, Winton D.; Schnettler, Richard A.; Claxton, George P.; and Dage, Richard C., 4,803,210, Cl. 514-293.000.
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Merritt, John H., III; and Shenberger, Paul S., to Ford New Holland, Inc. Knife assembly for net dispensing apparatuscu4,802,395, Cl. 83-649.000.
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Bays, Marvin G., 4,802,787, Cl. 404-90.000.
Mesch, Walter, to BASF Aktiengesellschaft. Preparation of 4-methylimidazolecu4,803,281, Cl. 548-335.000.
Messer Griesheim GmbH: *See*—
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Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Meszaros, Zoltan, deceased; Ritli, Peter; Sipos, Judit; and Pajor, Aniko , 4,803,274, Cl. 546-13.000.
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Meyers, Andrew H.; and Minkoff, Jeffrey, to Meyers, Andrew H. Lightweight, compact orthotic device for controlling knee instabilitiescu4,802,466, Cl. 128-80.00C.
Mezhinsky, Victor B., to Excellon Industries. Pick and place machine having improved centering jawscu4,802,816, Cl. 414-736.000.
Miano, Richard J. Ear protectorcu4,802,245, Cl. 2-209.000.
Michaels, Jennifer E.: *See*—
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Michaels, Leonard H.; and Miller, Robert A., to Molex Incorporated. Right angle strain relief adapter for electrical connectorscu4,802,864, Cl. 439-457.000.
Michaels, Thomas E.: *See*—
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Mielke, Klaus, to Swedot System AB. Device for generating fluid dropscu4,803,501, Cl. 346-140.00R.
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Miida, Takashi: *See*—
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Mijares, Ernest R.: *See*—
Clarke, Stephen E.; Hendry, James D.; and Mijares, Ernest R., 4,802,415, Cl. 102-434.000.
Miki, Ryota: *See*—
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Milbrandt, Artur, to Siemens Aktiengesellschaft. Ink printer means comprising interchangeable ink headscu4,803,500, Cl. 346-140.00R.
Miller, Calvin M., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber tapcu4,802,723, Cl. 350-96.150.
Miller, Francis G. Method for recovering fine clean coalcu4,802,976, Cl. 209-12.000.
Miller, George, to Hidrotronic Watercleaning Systems, Ltd. Method and apparatus for water purificationcu4,802,991, Cl. 210-705.000.
Miller, James G.; Pellet, Regis J.; Shamshoum, Edwar S.; and Rabo, Jule A., to UOP. Octane boosting catalystcu4,803,185, Cl. 502-65.000.
Miller, Michael A. Solar controlled water wellcu4,802,829, Cl. 417-12.000.
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Miller, Robert A.: *See*—
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Minnesota Mining and Manufacturing Company: *See*—
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Law, Kam W.; and Goethel, Walter W., 4,802,896, Cl. 51-298.000.
Ostrander, Kenneth A., 4,803,421, Cl. 324-72.000.
Powell, August L., 4,802,478, Cl. 128-334.00R.
Schaberg, Mark S., 4,803,239, Cl. 524-428.000.
Skorjanec, Joseph; and Moe, Carmen D., 4,803,130, Cl. 204-192.200.
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Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,803,509, Cl. 354-410.000.
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Mita Industrial Co., Ltd.: *See*—
Maeda, Masahiko, 4,803,510, Cl. 355-3.00R.
Mitchell, David J.: *See*—
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Mitel Corporation: *See*—
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Mitsubishi Denki Kabushiki Kaisha: *See*—
Edajima, Toshikazu, 4,802,379, Cl. 74-502.600.
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Inoue, Yasuo; and Ikeda, Takeshi, 4,802,760, Cl. 356-31.000.
Iwatani, Shiro; and Tokugawa, Kazuya, 4,803,377, Cl. 290-38.00R.
Kimata, Masafumi, 4,803,709, Cl. 377-58.000.
Miyamoto, Hiroshi; and Yamada, Michihiro, 4,803,663, Cl. 365-189.000.
Nakata, Syozo; and Imai, Satoshi, 4,803,329, Cl. 219-86.250.
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Sakai, Katsuyoshi, 4,803,564, Cl. 358-294.000.
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Takagi, Tadashi; Seino, Kiyoharu; and Takeda, Fumio, 4,803,443, Cl. 330-277.000.
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Umeda, Yasukazu; and Tsuji, Shintaro, 4,802,557, Cl. 187-127.000.
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Mitsubishi Mining & Cement Company, Ltd.: *See*—
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Mitsubishi Rayon Company, Ltd.: *See*—
Ikeda, Hiroyuki; Matsumoto, Yukihiro; and Nishimura, Koyu, 4,803,026, Cl. 264-216.000.
Oh-Kita, Motomu; Kato, Masaaki; and Kobayashi, Masao, 4,803,302, Cl. 562-534.000.
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Mitsugi, Shigeru: *See*—
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Mitsuhashi, Masakazu; Sakai, Shuzo; and Miyake, Toshio, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process to prepare solid products containing oil-soluble substancecu4,803,077, Cl. 424-439.000.
Mitsui Mining Company, Limited: *See*—
Yamada, Izumi; Oishi, Tetsuya; and Hanashita, Kazuhiko, 4,802,891, Cl. 44-51.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Itoh, Hiroyuki; Kono, Yoshitsugu; Ajioka, Masanobu; Takenaka, Shinji; and Kataita, Masafumi, 4,803,065, Cl. 423-502.000.
Yamada, Izumi; Oishi, Tetsuya; and Hanashita, Kazuhiko, 4,802,891, Cl. 44-51.000.
Yamaguchi, Keizaburo; Oikawa, Hideaki; Sugimoto, Kenichi; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,803,258, Cl. 528-211.000.
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Miyahara, Junji: *See*—
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Miyake, Izumi; Kaneko, Kiyotaka; and Oda, Kazuya, to Fuji Photo Film Co., Ltd. Motor control apparatus effecting phase control on rotating bodycu4,803,568, Cl. 360-33.100.
Miyake, Kazutoshi: *See*—
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Mitsuhashi, Masakazu; Sakai, Shuzo; and Miyake, Toshio, 4,803,077, Cl. 424-439.000.

Miyama, Hidetoshi: *See*—
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Miyamoto, Hiroshi; and Yamada, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory having divided bit lines and individual sense amplifierscu4,803,663, Cl. 365-189.000.
Miyashita, Tsune: *See*—
Yasuda, Makoto; Miyashita, Tsune; Murayama, Seiichi; Arai, Yoji; and Yamada, Fuzio, 4,803,406, Cl. 315-174.000.
Miyashita, Yasuo; and Kashima, Masao, to Mitsubishi Mining & Cement Company, Ltd. Dielectric ceramic composition for multilayer capacitorcu4,803,591, Cl. 361-321.000.
Miyatake, Takafumi; Matsushima, Hitoshi; Ohtani, Shigeko; and Higashino, Junichi, to Hitachi, Ltd. Management system of graphic datacu4,803,477, Cl. 340-747.000.
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Miyazaki, Tadaaki; Ogino, Takao; Masuda, Yoshitomo; and Kawagoe, Takahiro, to Bridgestone Corporation. Non-aqueous electrolyte secondary cellcu4,803,137, Cl. 429-194.000.
Miyazawa, Akiyasu; Harada, Mineo; Tajima, Eiji; and Abe, Takao, to Hitachi, Ltd. Print head having a wear resistant rotational fulcrumcu4,802,776, Cl. 400-124.000.
Mizoguchi, Shoichi, to NEC Corporation. 8-phase phase-shift keying demodulatorcu4,803,438, Cl. 329-50.000.
Mizukoshi, Yasumasa; and Ishijima, Minoru, to Nippon Seiko Kabushiki Kaisha. Clamp bandcu4,802,261, Cl. 24-20.01T.
Mizuno, Chiaki: *See*—
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Saito, Shinji; Araki, Hiroaki; Ejiri, Kiyomi; Ogawa, Hiroshi; and Mizuno, Chiaki, 4,803,131, Cl. 428-694.000.
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Sandefur, Charles W.; and Thomas, Thomas J., 4,802,888, Cl. 8-524.000.
Mobil Oil Corporation: *See*—
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Chen, Nai Y.; Degnan, Thomas F.; and Weisz, Paul B., 4,803,186, Cl. 502-66.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,802,971, Cl. 208-13.000.
Moe, Carmen D.: *See*—
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Molex Incorporated: *See*—
Michaels, Leonard H.; and Miller, Robert A., 4,802,864, Cl. 439-457.000.
Molins PLC: *See*—
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Mollard, Paul: *See*—
Rousset, Abel; Salvaing, Christiane B.; Mollard, Paul; Manoux, Alain; and Tailhades, Philippe, 4,803,291, Cl. 556-31.000.
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Momoki, Yasuhito; and Hasebe, Kazunori, to Fuji Photo Film Co., Ltd. Silver halide photographic material containing novel chloride contentcu4,803,152, Cl. 430-567.000.
Momose, Yuya, to NEC Corporation. Time-of-day coincidence systemcu4,803,708, Cl. 377-28.000.
Monarch Marking Systems, Inc.: *See*—
Benge, S. Eugene, 4,802,944, Cl. 156-247.000.
Monfort, Guy A.; and Bragard, Adolphe A., to Centre de Recherches Metallurgiques-Centrum Voor Research in De Metallurgie. Continuous measurement of the surface roughness of a cold-rolled productcu4,803,374, Cl. 250-571.000.
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Monsanto Company: *See*—
Highfill, Louis A., 4,803,058, Cl. 252-135.000.
Mosser, George J.; and Roy, Albert A., to Raytheon Company. Radio frequency array antenna with energy resistive materialcu4,803,495, Cl. 343-777.000.
Montedipe S.p.A.: *See*—
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Montefiore Hospital Association of Western Pennsylvania, Inc.: *See*—
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Montino, Franco; and Spoto, Giuseppe, to Montedison S.p.A. Process for preparing titanium dioxide in the form of spherical particles by hydrolysis of Ti(IV)cu4,803,064, Cl. 423-612.000.
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Moore, Terry R.: *See*—
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Moorehead, Robert M. Light attenuation motion transducer wherein two fiber optic cables abut at the pivot axis of pivotable mounting memberscu4,803,353, Cl. 250-227.000.
Morales-Rios, Martha S.: *See*—
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Moranz, Richard F., to Kendale Industries. Rubber tired roller bearingcu4,802,519, Cl. 152-325.000.
Moret, Willem, to Machinefabriek de Remise B.V. Concrete fabrication and concrete suctioning methodcu4,803,034, Cl. 264-504.000.
Mori, Fumihiko: *See*—
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Saito, Tamio; Takayama, Satoshi; Suda, Yoshiyuki; Shimada, Osamu; and Mori, Ken-ichi, 4,803,375, Cl. 250-578.000.
Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Orimo, Masayuki; Koizumi, Minoru; Kasajima, Hirokazu; and Nakai, Kozou, to Hitachi, Ltd. Method and apparatus for testing a distributed computer systemcu4,803,683, Cl. 371-19.000.
Mori, Masakazu: *See*—
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Morimoto, Tadaoki: *See*—
Usami, Kenichi; Kirihara, Seishin; Morimoto, Tadaoki; Doi, Hiroyuki; and Okada, Michiya, 4,802,894, Cl. 48-77.000.
Moriya, Koichi: *See*—
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Moriya, Tsutomu; and Nozaki, Hiroshi, to NGK Insulators, Ltd. Suspension insulatorcu4,803,311, Cl. 174-182.000.
Moroney, John W.; and Ralli, Jugal K., to Spalding & Evenflo Companies, Inc. Crib spring hanger assemblycu4,802,248, Cl. 5-11.000.
Moroni, Renato; and Brocci, Marino, to Montedipe S.p.A. Polyolspolyesters and use thereof in the production of polyurethane foamscu4,803,230, Cl. 521-168.000.
Morris, Alan J.; and Coe, Merlin D., to Kerr-McGee Chemical Corporation. System for increasing the capacity of a titanium dioxide producing processcu4,803,056, Cl. 422-156.000.
Morris, Marion C.: *See*—
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Morse, Chris L. Overflow spillage preventer for fuel tanks in boatscu4,802,514, Cl. 141-86.000.
Morse, Hugh B.; and Ciolino, John V. Sanitary foodstuff dispensercu4,802,609, Cl. 222-158.000.
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Mosteller, Larry A.: *See*—
Scholten, Richard A.; and Mosteller, Larry A., 4,802,523, Cl. 160-354.000.
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Motoki, Hideo, to Fujii, Minoru. Refractory coating compositioncu4,802,921, Cl. 106-18.120.
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Burger, Marilyn S.; and McKee, John M., 4,802,638, Cl. 242-85.100.
DeLuca, Michael J.; and Willard, David F., 4,803,703, Cl. 375-116.000.
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Levine, Stephen N.; Puhl, Larry C.; Bliss, Harry M.; and Corrigan, Gerald E., 4,803,726, Cl. 380-48.000.
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Motowidlo, Leszek R.: *See*—
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Mottur, George P.; Peters, Norman E.; and Nietz, Ron L., to Borden, Inc. Corn spirals and method of manufacturecu4,803,091, Cl. 426-439.000.

Mouche , Richard J.; and Lin, Mei-Jan L., to Nalco Chemical Company. Biocide treatment to control sulfate-reducing bacteria in industrial process waterscu4,802,994, Cl. 210-759.000.

Mouche', Richard J.; and Lin, Mei-Jan L., to Nalco Chemical Company. Biocides for treating industrial waters, particularly flue gas desulfurization scrubber sludgecu4,802,996, Cl. 210-764.000.

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Mowry, Greg S., to Magnetic Peripherals Inc. Double-gap magnetoresistive head having an elongated central write/shield pole completely shielding the magnetoresistive sensor strip in the read gapcu4,803,580, Cl. 360-113.000.

Moy, Timothy Y.; and Radcliff, Jeffery W., to Ashland Oil, Inc. Modified spray guns for vaporous amine-assisted spray coatings and method thereforcu4,802,627, Cl. 239-112.000.

Moyer, Harold W.; and Scholz, Harry R., to American Telephone and Telegraph Co., AT&T Bell Labs. Semiconductor integrated circuit packagescu4,803,540, Cl. 357-70.000.

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Mueller, Heinz; and Herold, Claus-Peter, to Henkel Kommanditgesellschaft auf Aktien. Powder-form lubricant additives for water-based drilling fluidscu4,802,998, Cl. 252-8.514.

Mueller, Herbert, to BASF Aktiengesellschaft. Preparation of polytetramethylene ether glycol diesters having a low color numbercu4,803,299, Cl. 560-240.000.

Mueller, Peter W.; and Leason, Jack M., to Peaktronics, Inc. Asynchronous communications systemcu4,803,481, Cl. 340-825.500.

Mueller, Richard A.; and Partis, Richard A., to G. D. Searle & Co. Process and intermediates for the preparation of halogenated protease inhibitorscu4,803,294, Cl. 560-54.000.

Mueller, Werner H.; Khanna, Dinesh N.; and Vora, Rohitkumar H., to Hoechst Celanese Corporation. Photosensitive polyimide polymer compositionscu4,803,147, Cl. 430-288.000.

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Mukai, Masato; and Komatsu, Koichi, to Honda Giken Kogyo Kabushiki Kaisha. Method for producing connecting rod of reciprocating motion systemcu4,802,269, Cl. 29-149.50C.

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Muller, Klaus-Helmut: *See*—
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Mullis, Kary B.: *See*—
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Munn, Robin W.; McClintic, Robert P.; and Reilly, Kenneth T., to GTE Products Corporation. Method for producing tungsten hexachloridecu4,803,062, Cl. 423-492.000.

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Muranaga, Tetsuro, to Kabushiki Kaisha Toshiba. Inference systemcu4,803,642, Cl. 364-513.000.

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Newell, Darryl C.; Schroeder, Karl F.; and Wilkie, Bruce J., to International Business Machines Corporation. Dual plane cross point switch architecture for a micro-PBXcu4,803,720, Cl. 379-202.000.
Newman, Anthony K., to Ratheon Company. Doppler-adaptive filter for non-zero mean dropout noisecu4,803,631, Cl. 364-462.000.
Neyer, James: *See*—
Schaller, David R.; Megahed, El-Sayed; Neyer, James; and Petterson, Tor, 4,803,605, Cl. 362-184.000.
NGK Insulators, Ltd.: *See*—
Kajiura, Yasuhiro, 4,802,845, Cl. 432-236.000.
Moriya, Tsutomu; and Nozaki, Hiroshi, 4,803,311, Cl. 174-182.000.
NGK Spark Plug Co., Ltd.: *See*—
Morii, Hiroaki, 4,802,369, Cl. 73-116.000.
N'Guyen, Huu Can, to Valeo. Control method for a reversible motor - generator electrical machine for a motor vehicle and control installation for the implementation of such methodcu4,803,376, Cl. 290-22.000.
Nichols, Nancie L.; and Svensen, Bjorn. Illuminated serving traycu4,803,604, Cl. 362-154.000.
Nietz, Ron L.: *See*—
Mottur, George P.; Peters, Norman E.; and Nietz, Ron L., 4,803,091, Cl. 426-439.000.
Nifco Inc.: *See*—
Hirohata, Toshio, 4,802,804, Cl. 411-433.000.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,803,277, Cl. 514-332.000.
Nii, Fumio: *See*—
Kojimoto, Susumu; Nii, Fumio; and Mori, Toshio, 4,802,305, Cl. 47-57.600.
Nii, Yasushi: *See*—
Sakakibara, Masayuki; and Nii, Yasushi, 4,803,301, Cl. 562-471.000.
Niimi, Koji; Kakubo, Yuji; and Ikegaya, Yuji, to Yamaha Corporation. Reverbation imparting devicecu4,803,731, Cl. 381-63.000.
Nijenhuis, Derk, to N.C.H. Hydraulische Systemen BV. Apparatus for loading and unloading an interchangeable container onto and from a vehiclecu4,802,811, Cl. 414-478.000.
Nikon Corporation: *See*—
Imamura, Kazunori; Hayano, Fuminori; Kakizaki, Yukio; and Kobayashi, Jiro, 4,803,373, Cl. 250-561.000.
Ohno, Koichi; Higashi, Kenji; and Tateno, Hiroki, 4,803,524, Cl. 355-53.000.
Nikura, Hideo, to Sony Corporation. Linear motorcu4,803,388, Cl. 310-12.000.
Nilsson, Torsten C., to Petainer S.A. Method of producing a containercu4,803,024, Cl. 264-80.000.
Nippon Air Brake Co., Ltd.: *See*—
Kojima, Katsumi; and Miki, Ryota, 4,802,563, Cl. 192-13.00A.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Komatsu, Hirotake, 4,803,675, Cl. 369-32.000.
Nippon Oil Co., Ltd.: *See*—
Kondo, Hitoshi; Sasaki, Makoto; and Kobayashi, Yukio, 4,803,248, Cl. 525-211.000.
Yokoyama, Nobuo, 4,803,013, Cl. 252-580.000.
Nippon Paint Co., Ltd.: *See*—
Kida, Katsuaki; Kashihara, Akio; Ishii, Keizou; and Kayano, Hiromichi, 4,803,252, Cl. 526-297.000.
Shibata, Toshiko; Ina, Hiroji; and Ina, Kazuo, 4,803,153, Cl. 435-2.000.
Nippon Petrochemicals Company, Limited: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Matsuzaka, Eiichi; and Narui, Satoshi, 4,803,238, Cl. 524-486.000.
Nippon Reinz Co., Ltd.: *See*—
Fujisawa, Katsuhide; Takanaka, Toshimasa; Buseki, Hiroo; and Takahashi, Masakatsu, 4,802,698, Cl. 285-363.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Mizukoshi, Yasumasa; and Ishijima, Minoru, 4,802,261, Cl. 24-20.0TT.
Takata, Hirotoshi, 4,802,775, Cl. 384-450.000.
Nippon Soken, Inc.: *See*—
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Nippon Steel Corp.: *See*—
Kashiwaya, Kunio; Haga, Hiroyo; Saeki, Nobuo; Yabuki, Youichi; Ozoe, Kuniyuki; Fukushima, Shinichi; and Tabata, Kazufumi, 4,802,270, Cl. 29-241.000.
Nippon Steel Welding Products & Engineering Co., Ltd.: *See*—
Kashiwaya, Kunio; Haga, Hiroyo; Saeki, Nobuo; Yabuki, Youichi; Ozoe, Kuniyuki; Fukushima, Shinichi; and Tabata, Kazufumi, 4,802,270, Cl. 29-241.000.
Nippon Telegraph and Telegraph Corporation: *See*—
Daikoku, Kazuhiro; and Ogose, Shigeaki, 4,803,739, Cl. 455-47.000.
Nippon Telegraph and Telephone Corporation: *See*—
Ogawa, Shigeki; and Tsukada, Eiichi, 4,803,389, Cl. 310-49.00R.
Nippon Zeon Co., Ltd.: *See*—
Nishina, Masaaki; and Kawahuti, Junsei, 4,803,260, Cl. 528-487.000.
Nippondenso Co., Ltd.: *See*—
Hoshizaki, Hiroki; Oyobe, Kazuo; Suzuki, Hirofumi; Kawahara, Nobuaki; Niwa, Hitoshi; and Kageyama, Terutaka, 4,803,345, Cl. 219-553.000.
Ichitani, Yutaka; Imaeda, Masayoshi; Ikeda, Yoshimasa; Nishimura, Yoji; and Seikou, Kiyokazu, 4,802,405, Cl. 98-2.060.
Kuroyanagi, Masatoshi; Matsui, Kazuma; Majima, Youzou; and Murakami, Fumiaki, 4,802,562, Cl. 192-1.230.
Nishi, Tomoya: *See*—
Suzuki, Kenji; Takagi, Toshiyuki; and Nishi, Tomoya, 4,803,653, Cl. 364-900.000.
Nishida, Yoshie; Hata, Seiji; and Tsuji, Masao, to Hitachi, Ltd. Method and apparatus for calculating position and orientation by combination of features of partial shapescu4,803,735, Cl. 382-8.000.
Nishigaki, Shinichi: *See*—
Yabe, Hisao; Kimura, Kenji; Kanno, Masahide; Tsuji, Kiyoshi; Yoshinaga, Jun; Yokoi, Takeshi; Ozeki, Kazuhiko; Nishigaki, Shinichi; Nakamura, Takeaki; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,803,550, Cl. 358-98.000.
Nishikawa, Kazuya: *See*—
Inaba, Hiroshi; Shinnai, Masao; Nishikawa, Kazuya; Ssitoh, Tamotsu; and Tsukada, Tokio, 4,803,492, Cl. 343-713.000.
Nishimukai, Tadahiko: *See*—
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Nishimura, Akihiro; Kawagishi, Masao; Sakumoto, Hideki; Matsui, Masahiko; and Shiomi, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Tape cassettes having bottom grooves for use in tape recorder having bottom projection in cassette holdercu4,803,575, Cl. 360-94.000.
Nishimura, Eiichi: *See*—
Kumahora, Hiroki; Hashimoto, Tsuneyuki; and Nishimura, Eiichi, 4,803,356, Cl. 250-306.000.
Nishimura, Kenji: *See*—
Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, 4,803,572, Cl. 360-60.000.
Nishimura, Koyu: *See*—
Ikeda, Hiroyuki; Matsumoto, Yukihiro; and Nishimura, Koyu, 4,803,026, Cl. 264-216.000.
Nishimura, Masaji: *See*—
Uo, Junko; Nishimura, Masaji; Horiguchi, Kazuo; Nakanishi, Setsuko; and Kaku, Shigeru, 4,803,154, Cl. 435-7.000.
Nishimura, Toshimichi; and Kikuchi, Atsushi, to Sony Corporation. Method of configuring an n- th degree switched capacitor filtercu4,803,650, Cl. 364-825.000.
Nishimura, Yoji: *See*—
Ichitani, Yutaka; Imaeda, Masayoshi; Ikeda, Yoshimasa; Nishimura, Yoji; and Seikou, Kiyokazu, 4,802,405, Cl. 98-2.060.
Nishina, Masaaki; and Kawahuti, Junsei, to Nippon Zeon Co., Ltd. Recovery of vinyl chloride resin with aid of screencu4,803,260, Cl. 528-487.000.
Nishioka, Akira: *See*—
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Nishise, Hideya; Sakakibara, Susumu; and Imaizumi, Masaru, to Minolta Camera Kabushiki Kaisha. Toner supplying devicecu4,803,513, Cl. 355-3.0DD.
Nishiyama, Noboru: *See*—
Sato, Kouki; Matsuyama, Junya; and Nishiyama, Noboru, 4,803,340, Cl. 219-146.100.
Nishiyama, Tamotsu; Watanabe, Toshinori; Horie, Noboru; Furihata, Makoto; Kominami, Yasuo; and Mori, Fumihiko, to Hitachi Ltd.; and

Hitachi Micro Computer Eng. Ltd. Circuit translatorcu4,803,636, Cl. 364-491.000.
Nissan Motor Company Limited: *See—*
Abo, Toshimi, 4,802,455, Cl. 123-425.000.
Hiraiwa, Kazuyoshi, 4,802,385, Cl. 74-758.000.
Komatsu, Hiroshi, 4,802,820, Cl. 415-201.000.
Mihara, Teruyoshi, 4,803,532, Cl. 357-234.000.
Murakami, Takuya; and Kamimoto, Toshihiko, 4,802,688, Cl. 280-666.000.
Nissels, Robert, to Societe Berthoud S.A. Connecting rod assemblies intended for the reciprocating driving of a piston inside a cylindercu4,802,382, Cl. 74-579.00R.
Nisso Petrochemical Industries Co., Ltd.: *See—*
Kitamura, Satoshi; Tobita, Takashi; Kanazawa, Motoki; and Shiozaki, Masahiro, 4,803,288, Cl. 549-267.000.
Nitschke, Karl D.: *See—*
Rasberry, Joseph D.; and Nitschke, Karl D., 4,803,654, Cl. 364-900.000.
Nitzan, Meir, to Jerusalem College of Technology. Method for carrying out blood flow measurements and a probe thereforcu4,802,489, Cl. 128-691.000.
Niwa, Hitoshi: *See—*
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Nixdorf Computer AG: *See—*
Bogdanski, Michael, 4,803,583, Cl. 360-128.000.
Schreiber, Harald, 4,803,722, Cl. 379-413.000.
Nobis, Dieter: *See—*
Schwarz, Reinhard; Stuhrmann, Heinz; and Nobis, Dieter, 4,802,384, Cl. 74-745.000.
Noe, Lewis J.: *See—*
Bowen, John M.; Sullivan, Patrick J.; Blanche, M. Sterling; Essington, Michael; and Noe, Lewis J., 4,802,761, Cl. 356-301.000.
Noerenberg, Marc D.; and Stasz, Peter, to Everest Medical Corporation. Electro-surgical instrumentcu4,802,476, Cl. 128-303.140.
Noguchi, Haruo: *See—*
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Noguchi, Takeshi: *See—*
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Nordica S.P.A.: *See—*
Sartor, Mariano, 4,802,291, Cl. 36-119.000.
Nordvall, Jan O., to ASEA Aktiebolag. Magnetoelastic force transducercu4,802,368, Cl. 73-862.690.
Noro, Masao, to Yamaha Corporation. Amplifying circuitcu4,803,441, Cl. 330-257.000.
Norris, Andrew P.; and Smith, Martin S., to STC PLC. Wide band antennacu4,803,494, Cl. 343-770.000.
North American Philips Corporation, Signetics Division: *See—*
Sill, Edward L.; and Hilton, Paul G., 4,803,173, Cl. 437-29.000.
North American Specialties Corporation: *See—*
Seidler, Jack, 4,802,862, Cl. 439-83.000.
Northern Commercial Limited: *See—*
Shimizu, Satoshi, 4,802,687, Cl. 280-615.000.
Northington, Bengie. Debris receiving troughcu4,802,395, Cl. 211-88.000.
Nose, Noriyuki: *See—*
Baba, Takeshi; Suda, Shigeyuki; Nose, Noriyuki; Kawakami, Eigo; Nakajima, Toshiyuki; and Kushibiki, Nobuo, 4,802,746, Cl. 350-418.000.
Noto, Yasuo; and Sugiura, Noboru, to Hitachi, Ltd. Power steering apparatus and control system for power steering apparatus having a steering wheel angle detection devicecu4,803,629, Cl. 364-424.050.
Nottingham, Lawrence D.; Michaels, Thomas E.; and Michaels, Jennifer E., to Westinghouse Electric Corp. Ultrasonic signal processing system including a flaw gatecu4,803,638, Cl. 364-507.000.
Notzel, Siegfried: *See—*
Baier, Manfred; Kaspar, Klaus P.; Schafer, Rainer; Trager, Ulrich; and Notzel, Siegfried, 4,803,171, Cl. 436-530.000.
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Marcon, Jean-Pierre, 4,803,041, Cl. 376-261.000.
Nowak, Frank A., Jr.: *See—*
Iovine, Carmine P.; and Nowak, Frank A., Jr., 4,803,071, Cl. 424-70.000.
Nowakowski, Robert J.; and Riesberg, Van V., Jr., to General Motors Corporation. Vehicle battery discharging indicatorcu4,803,417, Cl. 320-48.000.
Nozaki, Hiroshi: *See—*
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N.V. Raychem SA: *See—*
Peigneur, Paul G. L.; Leest, Yvo F. H.; and Van Beersel, Jozef F. L., 4,803,104, Cl. 428-35.100.
Nystuen, Arne M., to Whirlpool Corporation. Pump motor/basket brake for an automatic washercu4,802,347, Cl. 68-23.700.
Nystuen, Paul A.; Batcheller, Barry D.; Brekkestran, Kevin L.; and Kraning, Calvin J., to J. I. Case Company. Steering control system for articulated vehiclecu4,802,545, Cl. 180-135.000.
Obara, Haruki, to Fanuc Ltd. Electrical power feeder for a wire electrode type electrical discharge machining apparatuscu4,803,327, Cl. 219-69.00W.
Obara, Haruki, to Fanuc Ltd. Wire guide for electric discharge wire cuttingcu4,803,328, Cl. 219-69.00W.
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Gilmore, Charles B.; Kisak, James L.; Oberst, Jeffrey P.; Wood, John D.; and Baloh, Frank J., 4,803,042, Cl. 376-272.000.
Occelli, Mario L., to Union Oil Company of California. Process for producing a crystalline galliosilicate with the faujasite structurecu4,803,060, Cl. 423-326.000.
Occidental Chemical Corporation: *See—*
Kulpa, Charles F.; and Johnston, Michael G., 4,803,166, Cl. 435-253.300.
Ochs, Charles S.; and Koontz, Carl E., to Anchor Hocking Corporation. Method and apparatus for molding a closure capcu4,803,031, Cl. 264-255.000.
Ochs, Vincent W.: *See—*
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Ocken, Howard: *See—*
Ohrimer, Evan K.; Whelan, Edward P.; Wada, Tsuguyasu; and Ocken, Howard, 4,803,045, Cl. 420-57.000.
OCLC Online Computer Library Center Incorporated: *See—*
Hickey, Thomas B., 4,803,643, Cl. 364-523.000.
Oda, Kazuya: *See—*
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Oda, Shunri: *See—*
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Odagawa, Yoshimoto; Yanagisawa, Yasushi; and Imaizumi, Hiraku, to TDK Corporation. Magnetic tilt sensorcu4,803,426, Cl. 324-207.000.
O'Dell, Mark A. Top and bottom bed-sheeting combinationcu4,802,251, Cl. 5-502.000.
Offenburger, Mark; Parker, Eric; and Ptak, Frank, to Illinois Tool Works Inc. Threaded fastenercu4,802,807, Cl. 411-387.000.
Officine Augusto Cattani & C. S.p.A.: *See—*
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Ogata, Katsuya: *See—*
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Ogawa, Hiroshi; Mizuno, Chiaki; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic tape having a leader tapecu4,803,120, Cl. 428-323.000.
Ogawa, Hiroshi: *See—*
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Tomosada, Masahiro; Ogawa, Hiroshi; Tohyama, Yoshikuni; Adachi, Hideki; Suzuki, Tadashi; and Ohki, Naoyuki, 4,803,520, Cl. 355-7.000.
Ogawa, Shigeki; and Tsukada, Eiichi, to Nippon Telegraph and Telephone Corporation. Stepping motor, method of driving the same and drive circuit thereforcu4,803,389, Cl. 310-49.00R.
Ogawa, Soichiro; and Sano, Toshihiko, to Hitachi, Ltd. Fluorescent lamp arrangement for uniformly illuminating a display panelcu4,803,399, Cl. 313-493.000.
Ogawa, Toshiaki: *See—*
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Ogawa, Yukio: *See—*
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Oget, Christian, to Cimsa Sintra. Method and device for the transmission of digital data by messages organized in framescu4,803,685, Cl. 371-33.000.
Ogino, Hidekazu; Kamitani, Hiroshi; Kamegai, Jun; Sawada, Hiroki; Hirota, Hajime; and Kurosaki, Tomihiro, to Kao Corporation. Water-soluble viscosity increasing agent and detergent composition containing the samecu4,803,010, Cl. 252-174.210.
Ogino, Kinji, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. System for controlling motor vehicle brakescu4,802,713, Cl. 303-119.000.
Ogino, Takao: *See—*
Miyazaki, Tadaaki; Ogino, Takao; Masuda, Yoshitomo; and Kawagoe, Takahiro, 4,803,137, Cl. 429-194.000.
Ogose, Shigeaki: *See—*
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Ogren, Warren. Resin-based chewing tobaccocu4,802,498, Cl. 131-359.000.
Ogura, Mitsuru; Yoshida, Takeshi; and Yoshiura, Shoichiro, to Sharp Kabushiki Kaisha. Image forming cartridge for providing uniform corona chargingcu4,803,512, Cl. 355-3.0CH.
Oh-Kita, Motomu; Kato, Masaaki; and Kobayashi, Masao, to Mitsubishi Rayon Co., Ltd. Process for the production of methacrylic acidcu4,803,302, Cl. 562-534.000.
Ohdake, Eishu: *See—*
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Ohdate, Mitsuo, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacturing pressure contact semiconductor devicescu4,803,180, Cl. 437-222.000.
Ohfune, Yasufumi; and Sakaitani, Masahiro, to Suntory Limited. Process for producing statin and related compoundscu4,803,292, Cl. 560-29.000.
Ohgoda, Makoto: *See—*
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Ohhara, Hideto: *See—*
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Ohira, Manabu: *See—*
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Ohki, Naoyuki: *See*—
Tomosada, Masahiro; Ogawa, Hiroshi; Tohyama, Yoshikuni; Adachi, Hideki; Suzuki, Tadashi; and Ohki, Naoyuki, 4,803,520, Cl. 355-7.000.

Ohkita, Masao; and Ohmori, Shinichi, to Alps Electric Co., Ltd. Disc driving devicecu4,803,576, Cl. 360-99.080.

Ohkuma, Hiroaki: *See*—
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Ohkuma, Yoshinori: *See*—
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Ohkuwa, Hideki; and Hasegawa, Akira, to Olympus Optical Co., Ltd. Endoscope illuminating optical system devicecu4,802,460, Cl. 128-6.000.

Ohlendorf, Heinrich-Wilhelm; Kaupmann, Wilhelm; Kuehl, Ulrich; Buschmann, Gerd; and Magda, Stephen J., to Kali-Chemie Pharma GmbH. 1-Phenyl-2-aminocarbonylindole compounds, preparation thereof and pharmaceutical compositions containing themcu4,803,198, Cl. 514-212.000.

Ohmori, Shinichi: *See*—
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Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Reel mounting device on fishing rodscu4,802,299, Cl. 43-22.000.

Ohno, Kinichiro; and Kawata, Tomoshi, to Tokyo Kikai Seisakuchi, Ltd. Production process control system in newspaper printingcu4,803,634, Cl. 364-478.000.

Ohno, Koichi; Higashi, Kenji; and Tateno, Hiroki, to Nikon Corporation. Method of and apparatus for detecting the accuracy of superposition exposure in an exposure apparatuscu4,803,524, Cl. 355-53.000.

Ohno, Masafumi: *See*—
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Ohno, Takehiro; and Watanabe, Rikizo, to Hitachi Metals, Ltd. Single-crystal Ni-based super-heat-resistant alloycu4,802,934, Cl. 148-404.000.

Ohnuma, Kenji: *See*—
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Ohriner, Evan K.; Whelan, Edward P.; Wada, Tsuguyasu; and Ocken, Howard, to Electric Power Research Institute, Inc. Cobalt-free, iron-base hardfacing alloyscu4,803,045, Cl. 420-57.000.

Ohta, Masahiro: *See*—
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Ohtani, Shigeko: *See*—
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Ohtomo, Fumio; and Otani, Hitoshi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Method and apparatus for measuring coordinatescu4,803,645, Cl. 364-560.000.

Oikawa, Hideaki: *See*—
Yamaguchi, Keizaburo; Oikawa, Hideaki; Sugimoto, Kenichi; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,803,258, Cl. 528-211.000.

Oishi, Tetsuya: *See*—
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Oizumi, Masayuki: *See*—
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Okada, Masahiro: *See*—
Takahashi, Toshiro; Kuwabara, Ken-ichi; and Okada, Masahiro, 4,803,149, Cl. 430-264.000.

Okada, Michiya: *See*—
Usami, Kenichi; Kirihara, Seishin; Morimoto, Tadaoki; Doi, Hiroyuki; and Okada, Michiya, 4,802,894, Cl. 48-77.000.

Okada, Noriyuki: *See*—
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Okada, Toyokazu; Higashi, Koji; and Taguchi, Satoshi, to Sumitomo Chemical Company, Limited. Light-polarizing filmscu4,802,745, Cl. 350-397.000.

Okada, Toyokazu: *See*—
Okumura, Takuzo; Okada, Toyokazu; and Kikui, Hitoshi, 4,803,014, Cl. 252-585.000.

Okada, Tsuneyoshi, to PolyPlastics Co., Ltd. Composition for injection moldingcu4,803,235, Cl. 524-494.000.

Okagaki, Isao: *See*—
Koyama, Motoyasu; Teraoka, Hidetoshi; Akagi, Takao; Yamaguchi, Shinji; Sakamoto, Itsuki; Namba, Akira; and Okagaki, Isao, 4,803,332, Cl. 219-121.520.

Okami, Yoshinori: *See*—
Banba, Fumiyasu; and Okami, Yoshinori, 4,803,614, Cl. 364-200.000.

Okamoto, Isao; Terada, Katsuyuki; Go, Hiromi; Sebata, Michio; Higaki, Hiroshi; and Takai, Hideo, to Hitachi, Ltd. Wheelset steering apparatus and method for the truck of railway vehiclescu4,802,418, Cl. 105-167.000.

Okane, Yukihiro; Endo, Koji; and Nakai, Masayoshi, to Toyota Jidosha Kabushiki Kaisha. Device for controlling charging pressure of a supercharged internal combustion enginecu4,802,456, Cl. 123-564.000.

Okanishi, Toshiaki: *See*—
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Okazaki, Yoshitake: *See*—
Hirabayashi, Akio; Kaneko, Katsuaki; and Okazaki, Yoshitake, 4,802,408, Cl. 100-90.000.

Okumura, Takuzo; Okada, Toyokazu; and Kikui, Hitoshi, to Sumitomo Chemical Company Limited. Light-polarizing filmcu4,803,014, Cl. 252-585.000.

Okutu, Toshimitu: *See*—
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Olbrich, Bernd, to Franki & Kirchner GmbH & Co. KG. Industrial sewing machinecu4,803,411, Cl. 318-564.000.

O'Leary, Dennis E. Display container for a plurality of beltscu4,802,577, Cl. 206-278.000.

Olin Corporation: *See*—
Chatfield, Philip A.; and Shapiro, Eugene, 4,802,730, Cl. 350-96.230.

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Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.

Olofsson Corporation, The: *See*—
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Olsen, Richard, to Prime Computer, Inc. Horizontal scroll method and apparatuscu4,803,478, Cl. 340-726.000.

Olson, Bruce R. Apparatus for training skierscu4,802,856, Cl. 434-253.000.

Olson, Eugene T. Panel saw apparatuscu4,802,399, Cl. 83-425.000.

Olympus Optical Co., Ltd.: *See*—
Eino, Teruo, 4,803,562, Cl. 358-98.000.
Matsueda, Akira, 4,803,475, Cl. 340-750.000.
Ohkuwa, Hideki; and Hasegawa, Akira, 4,802,460, Cl. 128-6.000.
Togino, Takayoshi; Fujiwara, Hiroshi; Takabayashi, Yutaka; Nagano, Takashi; Fukaya, Takashi; Minami, Kazuyuki; and Tsunoda, Toshiyuki, 4,802,749, Cl. 350-516.000.
Yabe, Hisao; Kimura, Kenji; Kanno, Masahide; Tsuji, Kiyoshi; Yoshinaga, Jun; Yokoi, Takeshi; Ozeki, Kazuhiko; Nishigaki, Shinichi; Nakamura, Takeaki; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,803,550, Cl. 358-98.000.

Omni Holding Company: *See*—
Dombrowski, Anthony E., 4,803,488, Cl. 340-904.000.

Omron Tateisi Electronics Co.: *See*—
Sugahara, Youji; and Matsumura, Hideyuki, 4,803,347, Cl. 235-379.000.

O'Neal, Ronald L. Lawn dethatcher for a rotary cultivatorcu4,802,536, Cl. 172-42.000.

O'Neill, Charles E.: *See*—
Victorovich, Grigori S.; Diaz, Carlos M.; O'Neill, Charles E.; Bell, James A. E.; and Timberg, Lloyd M., 4,802,916, Cl. 75-24.000.
Victorovich, Grigori S.; Diaz, Carlos M.; and O'Neill, Charles E., 4,802,917, Cl. 75-26.000.

Onimaru, Sadahisa; Shimogawa, Toshiaki; Taguchi, Masahiro; and Kuwakado, Satosi, to Nippon Soken, Inc. Rotary seat for vehiclecu4,802,706, Cl. 296-68.000.

Onishi, Hiroyuki; Sano, Tetsuo; Hoki, Tetsuo; Kodama, Eiji; Tsujinaka, Hisayuki; and Kitakado, Ryuji, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for detecting pattern defectscu4,803,734, Cl. 382-8.000.

Ono, Katuya: *See*—
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Ono, Mitsumasa: *See*—
Kuwata, Sinichi; Katoh, Hiromasa; and Ono, Mitsumasa, 4,802,957, Cl. 204-1.00T.

Ono, Tetsuo: *See*—
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Onodera, Yoichi; Horiuchi, Hideyuki; and Shimbo, Chiaki, to Hitachi Medical Corp. Circuit for correcting output phase of rotary encodercu4,803,354, Cl. 250-231.0SE.

Ooki, Takao; and Eguchi, Jun, to Aichi Steel Works, Limited. Case hardened steel and method of manufacturing the samecu4,802,918, Cl. 75-10.610.

Opheim, Kent E.: *See*—
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Opina, Patricia B., to Hughes Aircraft Company. Via filling of green ceramic tapecu4,802,945, Cl. 156-247.000.

Oppl, Gunther; Pickel, Hermann; and Rauch, Horst, to FAG Kugelfischer Georg Schafer (KGaA). Combined spindle and bobbincu4,802,329, Cl. 57-129.000.

Orimo, Masayuki: *See*—
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Orlandi, Daniel A.: *See*—
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Ortho Pharmaceutical Corporation: *See*—
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Ortmann, Werner: *See*—
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Osafune, Koji: *See*—
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Osaki, Kouichi, to Ichikoh Engineering, Ltd. Pneumatically movable device with a safety lock meanscu4,802,401, Cl. 91-44.000.

Oscarsson, Johnny, to Svenska Rotor Maskiner AB. Internal combustion engine provided with a supercharger cu4,802,457, Cl. 123-564.000.

Oskam, Herman, to Hunter Douglas International N.V. Blind headrail bracketcu4,802,644, Cl. 248-251.000.

Ostertag, Werner; Czech, Erwin; Schmitt, Franz-Ulrich; and Schulze-Hagenest, Detlef, to BASF Aktiengesellschaft. Colored single-component toners and their preparationcu4,803,143, Cl. 430-106.600.

Ostrander, Kenneth A., to Minnesota Mining and Manufacturing Company. Multi input lightning detection systemcu4,803,421, Cl. 324-72.000.

O'Sullivan, Andrew W.: *See*—
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Oswald, Hendrikus J.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,802,268, Cl. 28-254.000.

Ota, Ikuo: *See*—
Hirota, Hozumi; Shimasaki, Yukihiro; Komoda, Hideaki; and Ota, Ikuo, 4,803,133, Cl. 428-695.000.

Otaka, Tadashi, to Hitachi, Ltd. Purification device for charged particle beam diaphragmcu4,803,369, Cl. 250-310.000.

Otani, Hitoshi: *See*—
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Otomo, Shigekazu: *See*—
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Otto, Oberdan W.: *See*—
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Owa, Nobutaka: *See*—
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Owen-Corning Fiberglas Corporation: *See*—
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Owen, Hartley: *See*—
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Owyang, King: *See*—
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Oxysynthese: *See*—
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Ozawa, Kunitaka: *See*—
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Ozeki, Kazuhiko: *See*—
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Ozoe, Kuniyuki: *See*—
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Paap, Hans J.: *See*—
Bussian, Alfred E.; Williams, Thomas M.; Carmichael, Paul D.; and Paap, Hans J., 4,802,361, Cl. 73-61.10R.

Pacific BioSystems, Inc.: *See*—
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Pacific Kenyon Corp.: *See*—
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Pahl, Wolfgang: *See*—
Zibis, Peter; and Pahl, Wolfgang, 4,803,448, Cl. 333-151.000.

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Pal, Veronika: *See*—
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Palmer, James W., to AMP Incorporated. Electrical connector housing assemblycu4,802,867, Cl. 439-587.000.

Palmquist, John M.; and Saunders, Morton J., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Methods of and apparatus for reconfiguring optical fiber connector components and products produced therebycu4,802,726, Cl. 350-96.200.

Panafacom Limited: *See*—
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Panis, Marc J. I. I. J.: *See*—
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Pankove, Jacques I., to General Electric Company. Insulating film having electrically conducting portioncu4,803,528, Cl. 357-23.100.

Pansiera, Timothy. Bi-centric knee joint supportcu4,802,467, Cl. 128-88.000.

Pantini, Giovanni: *See*—
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Pape, David D., to Polaroid Corporation. Electronic imaging camera utilizing EPROM memorycu4,803,554, Cl. 358-209.000.

Park, Chong S., to Gold Star Co. Ltd. Module for use in receiving teletext signalcu4,803,551, Cl. 358-147.000.

Park, Young Sung: *See*—
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Pasiecznik, John, Jr.: *See*—
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Pasteris, Robert J., to Du Pont de Nemours, E. I., and Company. Phenyl-substituted sulfonamidescu4,802,911, Cl. 71-92.000.

Pasternak, Gavril W., to Sloan-Kettering Institute For Cancer Research. Opiate agonists and antagonistscu4,803,208, Cl. 514-282.000.

Patel, Narendrakumar M. Puzzle gamecu4,802,673, Cl. 273-153.00S.

Patrice, Corjon, to Schlumberger Technology Corporation. Tool for measuring pressure in an oil wellcu4,802,359, Cl. 73-151.000.

Patterson, John F., to Advanced Nuclear Fuels Corporation. Bwr assemblycu4,803,044, Cl. 376-444.000.

Paul, Manfred: *See*—
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Paulsen, Dean R. Flexural pivotcu4,802,720, Cl. 350-6.600.

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Peaktronica, Inc.: *See*—
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Pearson, Robert E., to Secrest, T. W., a part interest. Means and method for color separation and for reproductioncu4,803,523, Cl. 355-32.000.

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Peiffer, Herbert; Crass, Guenther; Dietz, Wolfgang; and Schloegl, Gunter, to Hoechst Aktiengesellschaft. Process for the production of biaxially stretched films and apparatus for implementation of the processcu4,803,027, Cl. 264-210.500.

Peigneur, Paul G. L.; Leest, Yvo F. H.; and Van Beersel, Jozef F. L., to N.V. Raychem SA. Article for joining dimensionally recoverable partscu4,803,104, Cl. 428-35.100.

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Miller, James G.; Pellet, Regis J.; Shamshoum, Edwar S.; and Rabo, Jule A., 4,803,185, Cl. 502-65.000.

Peng, Yao: *See*—
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Pennington, Rodney L., to Regenerative Environmental Equipment Co. Inc. Combustion apparatus with auxiliary burning unit for liquid fluidscu4,802,423, Cl. 110-233.000.

Pennwalt Corporation: *See*—
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Pepper, David M.; and Craig, Richard R., to Hughes Aircraft Company. Laser with grating feedback unstable resonatorcu4,803,696, Cl. 372-95.000.

Pepping, Franz, to U.S. Philips Corporation. Luminaire for a rod-shaped fluorescent lampcu4,803,600, Cl. 362-217.000.

Periou, Pierre, to Rockwell-CIM. Assembly of a door latch and anti-theft and anti-attack deactivating device for said latch, and latch which is part of said assemblycu4,802,350, Cl. 70-264.000.

Perman, William H., to Wisconsin Alumni Research Foundation. Short echo NMR imaging of sodiumcu4,803,432, Cl. 324-309.000.

Perry, Charles C. Apparatus to be used in conjunction with a forklift for lifting and moving a concrete slabcu4,802,813, Cl. 414-607.000.

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Trine, John A.; and Petersen, Daryle L., 4,803,599, Cl. 362-249.000.
Petersen, Frank P.; Maybroda, Adrianna M.; and Miller, Sally A., to Agri-Diagnostics Associates. Monoclonal antibodies to *Sclerotinia homoeocarpacu*4,803,155, Cl. 435-7.000.
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Petschulat, David J. Vibrato palm restcu4,802,397, Cl. 84-328.000.
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Pilbrow, John R.; Troup, Gordon J. F.; Tirkel, Anatol Z.; Hutton, Donald R.; Gruner, Lucian; and McLaren, Neil R. Electron spin resonance spectrometercu4,803,624, Cl. 324-316.000.
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Poldervaart, Leendert; and Hervouet, Raymond, to Single Buoy Moorings Inc. Mooring devicecu4,802,432, Cl. 114-230.000.
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Edwards, David G.; Finlay, Gerard; Boyle, David J.; Heasly, Clyde C., Jr.; Walsh, Joseph M.; and Poling, Ralph J., 4,802,412, Cl. 101-269.000.
Politi, Jean-Marie, to L'Air Liquide. Tap with flow limiter for gas bottlescu4,802,504, Cl. 137-454.500.
Pollack, Jack, to Amtel, Inc. Lightweight transfer referencing and mooring systemcu4,802,431, Cl. 114-230.000.
PolyPlastics Co., Ltd.: *See*—
Okada, Tsuneyoshi, 4,803,235, Cl. 524-494.000.
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Pool, Hazel: *See*—
Fox, Rodney T.; Cowen, Raymond A.; Pool, Hazel; and Cook, Robert V., 4,802,997, Cl. 252-8.600.
Poore, Henry B. Chrono-stethoscopecu4,802,550, Cl. 181-131.000.
Portaz, Joseph M.: *See*—
Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.
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Powell, August L., to Minnesota Mining and Manufacturing Company. Medical staple and removal methodcu4,802,478, Cl. 128-334.00R.
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Pralus, Christian, to Atochem; and Oxysynthese. Process for the cyclic production of hydrogen peroxidecu4,803,063, Cl. 423-588.000.
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Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See*—
Bauer, Karl-Heinz; and Eckert, Gerold, 4,803,323, Cl. 200-302.200.

Prescolite, Inc.: *See*—
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Bender, Paul E.; Lantos, Ivan; McGuire, Michael A.; Pridgen, Leadon N.; and Winicov, Herbert B., 4,803,279, Cl. 546-271.000.
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Pytryga, Frank G.; and Prince, Martin, 4,802,515, Cl. 141-97.000.
Procare AB: *See*—
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Cho, Boong Y., 4,803,715, Cl. 378-90.000.
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Lageder, Heinrich; Masek, Jaroslav; and Prochazka, Kamil, 4,802,403, Cl. 91-374.000.
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Proprietary Technology, Inc.: *See*—
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Pruett, Wayne P.; Hyatt, John A.; and Hilbert, Samuel D., to Eastman Kodak Company. Lignin and lignin derivatives as copolymerizable colorants for polyesterscu4,803,255, Cl. 527-400.000.
Pruett, Wayne P.: *See*—
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Psaras, Peter A.; Tu, King-Ning; and Thompson, Richard D, to International Business Machines Corporation. Dopant control of metal silicide formationcu4,803,539, Cl. 357-67.000.
Ptak, Frank: *See*—
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Puetter, Hermann; and Roske, Eckhard, to BASF Aktiengesellschaft. Concentrating aqueous solutions of organic compounds which contain salts, with simultaneous reduction of the salt contentcu4,802,965, Cl. 204-182.400.
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Pytryga, Frank G.; and Prince, Martin. Safety gas cylinder containment systemcu4,802,515, Cl. 141-97.000.
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Queval, Bruno: *See*—
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Raber, Peter E.; and Wisnieff, Robert E., to United Technologies Corporation. Reflection-enhanced flat panel displaycu4,803,402, Cl. 313-509.000.
Rabinkin, Anatol, to Allied-Signal Inc. Nickel-palladium based brazing alloyscu4,802,933, Cl. 148-403.000.
Rabinzohn, Patrick, to U.S. Philips Corporation. Method of forming interconnections and crossings between metallization levels of an integrated circuitcu4,803,177, Cl. 437-51.000.
Rabo, Jule A.: *See*—
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Moy, Timothy Y.; and Radcliff, Jeffery W., 4,802,627, Cl. 239-112.000.
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Klashka, John A.; Kaufman, Sidney L.; Kowal, Krzysztof A.; Lewis, Richard P.; Raisbeck, Susan L.; and McNamara, John L., Jr., 4,803,623, Cl. 364-200.000.
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Randin, Jean-Claude, to Les Fils D'Auguste Maillefer Societe Anonyme A Ballaigues. Parapulper restorative pin for and driver assemblycu4,802,848, Cl. 433-225.000.
Raniere, Jean E.; Smith, Steven L.; Gehrke, Russell P.; and Johnson, Richard E., Jr., to American National Can Company; and Kendall McGraw Laboratories, Inc. Multiple layer packaging films and packages formed thereofroncu4,803,102, Cl. 428-35.200.
Ranke, Horst: *See*—
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Buschor, Karl, 4,802,625, Cl. 239-3.000.
Rao, Mocherla K. K.: *See*—
Altman, Carl E.; and Rao, Mocherla K. K., 4,803,247, Cl. 525-179.000.
Rasberry, Joseph D.; and Nitschke, Karl D., to General Datacomm Industries, Inc. Circular first-in, first out buffer system for generating input and output addresses for read/write memory independentlycu4,803,654, Cl. 364-900.000.
Ratcliffe, Arnold H., to Imperial Chemical Industries PLC. Homocyclic derivativescu4,803,201, Cl. 514-239.200.
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Rauch, Horst: *See*—
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Rautomead Limited: *See*—
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Raychem Corporation: *See*—
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Rayovac Corporation: *See*—
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Raytheon Company: *See*—
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Dieterich, Charles B., 4,803,647, Cl. 364-724.170.
Reale, John, Jr.: *See*—
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Reckitt & Colman Products Limited: *See*—
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Reddy, Virupaksha K.: *See*—
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Reece, Alan R.: *See*—
Grinsted, Timothy W.; and Reece, Alan R., 4,802,793, Cl. 405-161.000.
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Hsueh, Liming; and Reed, Marion G., 4,802,533, Cl. 166-252.000.
Reed, William. Building constructioncu4,802,315, Cl. 52-79.400.
Rees, Robert C.: *See*—
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Regenerative Environmental Equipment Co. Inc.: *See*—
Pennington, Rodney L., 4,802,423, Cl. 110-233.000.
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Reihanian, Hertsel: *See*—
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Reilly, Kenneth T.: *See*—
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Reinecke, Paul: *See*—
Brandes, Wilhelm; Reinecke, Paul; Kaspers, Helmut; Scheinpflug, Hans; and Stetter, Jorg, 4,803,214, Cl. 514-383.000.
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Remigio, Ros; and Achim, Storz, to Dieter Grasslin Feinwerktechnik. Circuit arrangement for power supply for electrical and electronic control or regulating devicescu4,803,379, Cl. 307-112.000.
Rempfler, Hermann; Stamm, Erich; and Thummel, Rudolph C., to Ciba-Geigy Corporation. Ureas and their use as herbicidescu4,802,909, Cl. 71-92.000.
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Reusens, Peter P. F., to Alcatel N.V. Digital transmission systemcu4,803,437, Cl. 328-59.000.
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Ricoh Company, Ltd.: *See*—
Matsumoto, Kazuyoshi; Miyakawa, Seiichi; Obdake, Eishu; and Suzuki, Shigeru, 4,803,593, Cl. 361-225.000.
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Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Santel, Hans-Joachim; and Schmidt, Robert R., 4,802,910, Cl. 71-93.000.
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Nowakowski, Robert J.; and Riesberg, Van V., Jr., 4,803,417, Cl. 320-48.000.
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Riley, Larry D.; and Heidtmann, Denis L., to Tektronix, Inc. Imaging charge-coupled device having an all parallel outputcu4,803,531, Cl. 357-24.000.
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Rivoallan, Loic; and Guilloux, Jean-Yvon. Device for focusing a light beam and machine for welding optical fibres using this devicecu4,802,729, Cl. 350-96.210.
Rix Industries: *See*—
Hall, John M., 4,802,826, Cl. 417-243.000.
Robert Bosch GmbH: *See*—
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Fassel, Reinhard; Haubner, Georg; and Zobl, Hartmut, 4,803,590, Cl. 361-386.000.
Haarer, Rolf; Moser, Theo; and Reum, Klaus, 4,802,568, Cl. 198-388.000.
Roberts, Beverly K.; and Zahr, George E., to E. I Du Post De Nemours and Company. Microcrack resistant compositescu4,803,101, Cl. 428-116.000.
Roberts, Charles A. Mower attachmentcu4,802,327, Cl. 56-15.200.
Roberts, John M. L., to Triumph Motorcycles (Coventry) Limited. Balancer for internal combustion enginecu4,802,450, Cl. 123-192.00B.
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Rock, Erich; Hollenstein, Helmut; and Brunner, Josef, to Julius Blum Gesellschaft m.b.H. Fitting assembly for connecting the sidewall of a drawer to the rear wall thereofcu4,802,716, Cl. 312-330.00R.
Rockwell-CIM: *See*—
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Rockwell International Corporation: *See*—
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Rocky Mountain Enterprises, Inc.: *See*—
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Rodriguez, Michael. Bicycle support apparatuscu4,802,666, Cl. 272-73.000.
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Rolm Corporation: *See*—
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Root, Randolph E., to Hughes Aircraft Company. Method of making a chip carrier slotted arraycu4,802,277, Cl. 29-846.000.
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Rosinski, Adam: *See*—
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Roske, Eckhard: *See*—
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Rostoker, Inc.: *See*—
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Rostoker, William: *See*—
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Rousset, Abel; Salvaing, Christiane B.; Mollard, Paul; Manoux, Alain; and Tailhades, Philippe, to Centre National de la Recherche Scientifique; and Universite Paul Sabatier. Particulate compositions of ferromagnetic metal oxalates in the form of submicronic acicular particles, the preparation of same and application thereofcu4,803,291, Cl. 556-31.000.
Rowe, Jerry D., to Rocky Mountain Enterprises, Inc. Game hunting knifecu4,802,279, Cl. 30-155.000.
Rowland, Robert O., to Hudson Oxygen Therapy Sales Co. Ventilator monitor and alarm apparatuscu4,803,471, Cl. 340-626.000.
Rowley, William W. Method of forming a flange or bellows in a plastic tubcu4,803,033, Cl. 264-339.000.
Roy, Albert A.: *See*—
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Ryan, Robert E., to Grumman Aerospace Corportion. Glass bead laser amplifier with phase conjugate mirrorcu4,803,439, Cl. 330-4.300.
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Sakai, Kunihide, to Victor Company of Japan Ltd. Perpendicular magnetization type magnetic head having a magnetic pole part which forms a closed magnetic pathcu4,803,582, Cl. 360-119.000.
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Salmon, Michael E.; and Nemazi, John E., to GMI Engineering & Management Institute. Hinge for cable routingcu4,802,605, Cl. 220-338.000.
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Doleschel, Walter; Doleschel, Walter N.; and Kaltschmid, Helmut, 4,803,073, Cl. 424-101.000.
Schwartz, Robert E.; Hirsch, Charles F.; Sigmund, Janet M.; and Pettibone, Douglas J., to Merck & Co., Inc. Hapalindolinone compounds as vassopressin antagonistscu4,803,217, Cl. 514-409.000.
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Schwetz, Karl-Alexander; Grellner, Wolfgang; Hunold, Klaus; Mohr, Max; and Lipp, Alfred, to Elektroschmelzwerk Kempten GmbH. Dense molded bodies of polycrystalline aluminum nitride and process for preparation without use of sintering aidscu4,803,183, Cl. 501-96.000.
Scifres, Donald R.; Kung, Hsing; Cross, Peter; Burnham, Robert D.; and Streifer, William, to Spectra Diode Laboratories, Inc. Lateral superradiance suppressing diode laser barcu4,803,691, Cl. 372-150.000.
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Sebata, Michio: *See*—
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Edwards, David G.; Finlay, Gerard; Boyle, David J.; Healy, Clyde C., Jr.; Walsh, Joseph M.; and Poling, Ralph J., 4,802,412, Cl. 101-269.000.
Seider, Gene J., to FMC Corporation. Electric drive motorcu4,803,387, Cl. 310-12.000.
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Seifert, Harald, to KTV Sicherheitstechnik GmbH. Security fence with security wires fastened to posts via sensorscu4,803,468, Cl. 340-566.000.
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Seinera, Henri; Luberne, Patricia; Stock, Claude; and Trouve, Patrick, to Pluess Staufer A. G. Thermoplastic compositions with very high content of pulverulent mineral materials for incorporation into polymerscu4,803,231, Cl. 523-219.000.
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Senyagin, Georgy V.; and Kazakov, Anatoly V., to Nauchno-Issledovatelsky Proektno-Konstruktorsky I Tekhnologichesky Kabelny Institut Niki Po "Sredazkabel". Method of manufacturing wire ropes and wire rope twisting machine for effecting the samecu4,802,328, Cl. 57-9.000.
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Mack, Daniel R., 4,803,050, Cl. 422-65.000.
Serban, Alexander; Watson, Keith G.; and Farquharson, Grame J., to ICI Australia Limited. 2-quinoxalinyloxy phenoxy compoundscu4,803,273, Cl. 544-354.000.

Seto, Kimio; and Ohgoda, Makoto, to Fuji Photo Film Co., Ltd. Light-tight envelope for high-speed conveyance of stimulable phosphor sheetcu4,802,618, Cl. 229-68.00R.
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Taguchi, Toshimichi, 4,803,308, Cl. 174-68.500.
Takiguchi, Haruhisa; Kaneiwa, Shinji; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,803,690, Cl. 372-45.000.
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Shea, John J., to Richards Medical Company. Irrigated drill and quick-release chuck assemblycu4,802,852, Cl. 433-127.000.
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Sheerer, Thomas J., to Texas Instruments Incorporated. Dot matrix printer having increased impact force and higher operating frequencycu4,802,781, Cl. 400-124.000.
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Shibata, Toshiko; Ina, Hiroji; and Ina, Kazuo, to Nippon Paint Co., Ltd. Process for separating blood serum from bloodcu4,803,153, Cl. 435-2.000.
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Shigeta, Yukio; Harano, Yutaka; Yamada, Shigeki; and Takahaski, Yoshinori, to Kabushiki Kaisha Kyoto Daiichi Kagaku; and Kabushiki Kaisha Sanwa Kagaku Kenkyusho. Composition used for the determination of beta-hydroxybutyric acid and a method for preparing the said compositioncu4,803,158, Cl. 435-25.000.
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Shindo, Hitoshi; Enari, Masahiko; and Kuno, Mitsutoshi, to Canon Kabushiki Kaisha. Optical modulation apparatuscu4,802,744, Cl. 350-339.00F.
Shine, Ward, to Frito-Lay, Inc. Shelf-stable, soft dough productcu4,803,084, Cl. 426-20.000.
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Brust, Hans-Detlef, 4,803,357, Cl. 250-310.000.
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Heynisch, Hinrich; Hauser, Josef; and Hubner, Erwin, deceased, 4,803,397, Cl. 313-337.000.
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Kovalak, Judson L., Jr., 4,802,296, Cl. 40-607.000.
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Sill, Edward L.; and Hilton, Paul G., to North American Philips Corporation, Signetics Division. Method of fabrication of semiconductor device having a planar configurationcu4,803,173, Cl. 437-29.000.
Sillerud, Dean R.; and Peterscheck, Hermann W., to VerTech Treatment Systems, Inc. Asymmetric heat-exchange reaction apparatus for effecting chemical reactionscu4,803,054, Cl. 422-109.000.
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Sittig, Roland, to Siemens Aktiengesellschaft. Method of manufacturing thyristor with integrated power supply for an associated circuitcu4,803,172, Cl. 437-6.000.
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Pasternak, Gavril W., 4,803,208, Cl. 514-282.000.
Smart, Jerome T.; and Tierney, Mark D. Instrument support apparatuscu4,802,613, Cl. 224-204.000.
Smart, Roderick M., to Fosroc International Limited. Capsules of high alumina cement compositionscu4,802,922, Cl. 106-89.000.
Smedley, William H.: *See*—
Haber, Terry M.; and Smedley, William H., 4,802,479, Cl. 128-344.000.
Smiley, Robert A., to Du Pont de Nemours, E. I., and Company. Recovery of bis(hexamethylene)triaminecu4,803,304, Cl. 564-498.000.
Smith, Barry W. Milk carton with folded spoutcu4,802,590, Cl. 206-620.000.
Smith, Clifford E.: *See*—
Kukes, Simon G.; and Smith, Clifford E., 4,802,920, Cl. 75-118.00R.
Smith, Dan R. Football blocking apparatuscu4,802,670, Cl. 273-55.00R.
Smith, Edward J., to ALC Co., Inc. Abrasive blasting systemcu4,802,313, Cl. 51-438.000.
Smith, Gary I., to Brammall, Inc. Snap lock assemblycu4,802,699, Cl. 292-327.000.
Smith, Gordon C. D., to Glaxo Group Limited. Process for preparing cephalosporin compoundscu4,803,267, Cl. 540-224.000.
Smith International, Inc.: *See*—
Hall, David R.; and Cross, Donald G., 4,802,539, Cl. 175-329.000.
Smith, James F.: *See*—
Bennett, William R.; Mix, Tom; and Smith, James F., 4,802,684, Cl. 280-291.000.
Smith, Joseph M.: *See*—
Cohen, Richard J.; and Smith, Joseph M., 4,802,491, Cl. 128-702.000.
Smith-Lewis, Margaret J., to Eastman Kodak Company. Analytical element and method for determination of total lacate dehydrogenasecu4,803,159, Cl. 435-26.000.
Smith, Martin A., to Pave-Mark Corporation. Road marking apparatuscu4,802,788, Cl. 404-94.000.
Smith, Martin S.: *See*—
Norris, Andrew P.; and Smith, Martin S., 4,803,494, Cl. 343-770.000.
Smith, Marven M., II: *See*—
Lefevre, Marcel R.; and Smith, Marven M., II, 4,803,018, Cl. 261-111.000.
Smith & Nephew Associated Companies p.l.c.: *See*—
Edwards, Linda M., 4,803,066, Cl. 424-132.000.
Smith, Peter, to Marconi Company Limited, The. Thrusterscu4,802,333, Cl. 60-260.000.
Smith, Raymond H. Adjustable earth-moving attachment for a vehiclecu4,802,293, Cl. 37-108.00R.
Smith, Robert E.; and Fox, Eugene N., to Fluorodiagnostic Limited Partners. Composition, article and process for detecting a microorganismcu4,803,162, Cl. 435-36.000.
Smith, Roy E., to Urban Transportation Development Corporation. Steered axle for a railway vehiclecu4,802,419, Cl. 105-171.000.
Smith, Steven L.: *See*—
Raniere, Jean E.; Smith, Steven L.; Gehrke, Russell P.; and Johnson, Richard E., Jr., 4,803,102, Cl. 428-35.200.

Smithers, Michael J.: *See*—
Brewster, Andrew G.; Brown, George R.; and Smithers, Michael J., 4,803,220, Cl. 514-452.000.

SmithKline Beckman Corporation: *See*—
Bender, Paul E.; Lantos, Ivan; McGuire, Michael A.; Pridgen, Lendon N.; and Winicov, Herbert B., 4,803,279, Cl. 546-271.000.
Dalton, Barbara J.; and Rees, Robert C., 4,803,072, Cl. 424-85.50C.
Garris, Charles R.; Ruttenberg, Kenneth M.; and Neiswender, James L., Sr., 4,802,323, Cl. 53-53.000.

Snitovski, Jacov. Insulating block unit, a method for its manufacture, and a method of erecting a wall by means of such blockscu4,802,318, Cl. 52-309.120.

Soartec Corp: *See*—
Hayamizu, Mamoru, 4,803,499, Cl. 346-140.00R.

Societaa Cavi Pirelli S.p.A.: *See*—
Marin, Carlo; and Seveso, Cesare, 4,803,309, Cl. 174-106.00R.

Societe Anonyme de Telecommunications: *See*—
Fraize, Claude R.; Forja, Christian; and Calevo, Robert, 4,802,724, Cl. 350-96.200.

Societe Berthoud S.A.: *See*—
Nissels, Robert, 4,802,382, Cl. 74-579.00R.

Societe D'Exploitation de Brevets pour L'Industrie et la Marine: *See*—
Gemignani, Andre; Boulogne, Serge J.; and Schaumburg, Gerald, 4,802,505, Cl. 137-492.000.

Societe Europeenne de Propulsion: *See*—
Beboux, Jean, 4,803,038, Cl. 264-3.300.

Societe Industrielle de Liaisons Electriques: *See*—
Fraize, Claude R.; Forja, Christian; and Calevo, Robert, 4,802,724, Cl. 350-96.200.

Societe Nationale d-Etude et de Construction de Moteurs d-Aviation (SNECMA): *See*—
Caruel, Jacques E. J., 4,802,337, Cl. 60-749.000.

Societe Nationale d'Etude et Moteurs d'Aviation "S.N.E.C.M.A." : *See*—
Gastebois, Philippe M. D.; and Imbault, Jean-Francois R., 4,802,824, Cl. 416-193.00A.

Societe Nationale Elf Aquitaine: *See*—
Armand, Michel; Fouletier, Mireille; and Degott, Pierre, 4,803,249, Cl. 525-326.200.

Soemers, Hermanus M. J. R., to U.S. Philips Corporation. Method of mounting a deflection unit on a cathode ray tube envelope and combination resulting therefromcu4,803,559, Cl. 358-248.000.

Sogi, Hidehito; and Hori, Toshiyuki, to E. I Du Pont de Nemours and Company; and Toyo Tire & Rubber Company. Composite cushioncu4,803,118, Cl. 428-246.000.

Sohda, Chiharu: *See*—
Watanabe, Yoshimi; Kawamura, Hiroshi; and Sohda, Chiharu, 4,802,871, Cl. 440-75.000.

Soil Machine Dynamics Limited: *See*—
Grinsted, Timothy W.; and Reece, Alan R., 4,802,793, Cl. 405-161.000.

Solhjell, Erik, to Tandberg Data A/S. Circuit arrangement for the recognition of impermissable phase errors in a phase locked loopcu4,803,704, Cl. 375-120.000.

Sommargren, Gary E.: *See*—
Young, Peter S.; and Sommargren, Gary E., 4,802,764, Cl. 356-349.000.
Young, Peter S.; and Sommargren, Gary E., 4,802,765, Cl. 356-349.000.

Sommers, Steven F.: *See*—
Dombrowski, Anthony E., 4,803,488, Cl. 340-904.000.

Sonderegger, Hans-Conrad: *See*—
Calderara, Reto; Sonderegger, Hans-Conrad; and Wolfer, Peter, 4,802,371, Cl. 73-862.040.

Soneda, Mitsuo; and Hazama, Yoshikazu, to Sony Corporation. Liquid crystal display apparatuscu4,803,480, Cl. 340-784.000.

Sony Corporation: *See*—
Ishikawa, Reiji; and Kimura, Tomohiro, 4,803,337, Cl. 219-121.850.
Nikura, Hideo, 4,803,388, Cl. 310-12.000.
Nishimura, Toshimichi; and Kikuchi, Atsushi, 4,803,650, Cl. 364-825.000.
Soneda, Mitsuo; and Hazama, Yoshikazu, 4,803,480, Cl. 340-784.000.
Wilkinson, James H.; and Avis, Richard J. A., 4,803,567, Cl. 360-33.100.

Sorenson, Richard W.; Ives, Milton N.; and Sapone, Frank P., to Carlingswitch, Inc. Momentary rotary switchcu4,803,314, Cl. 200-11.00J.

Sostarich, Joseph J.: *See*—
Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.

Sota, Kaoru: *See*—
Kawashima, Yutaka; Satoh, Masakazu; Hatada, Yuichi; Hazato, Fumiko; Nakashima, Yoshimoto; and Sota, Kaoru, 4,803,266, Cl. 540-200.000.

Sotani, Junji; Koizumi, Tatsuya; Endo, Shiro; Mashino, Nobuyoshi; and Seo, Susumu, to The Furukawa Electric Co., 03, Ltd.; and Furukawa Construction Co., Ltd., The. Electric fluid heating apparatus utilizing a vaporizable working fluidcu4,803,343, Cl. 219-326.000.

Southwest Research Institute: *See*—
Hill, Ralph H., Jr., 4,802,762, Cl. 356-318.000.

Spalding & Evenflo Companies, Inc.: *See*—
Moroney, John W.; and Ralli, Jugal K., 4,802,248, Cl. 5-11.000.

Spector, Marshall, to Air Products and Chemicals, Inc. Method for protecting plants and plant matter from stressacu4,802,905, Cl. 71-68.000.

Spectra Diode Laboratories, Inc.: *See*—
Scifres, Donald R.; Kung, Hsing; Cross, Peter; Burnham, Robert D.; and Streifer, William, 4,803,691, Cl. 372-150.000.

Spicciati, Frank A.: *See*—
Fraenkel, Howard A.; Davenport, Karen A.; and Spicciati, Frank A., 4,803,097, Cl. 427-307.000.

Spira, Joel S.: *See*—
Jacoby, Elliot G., Jr.; D'Aleo, Michael J.; Luchaco, David G.; Spira, Joel S.; Wagner, Richard A.; Yuhasz, Stephen J.; and Dowler, David H., 4,803,380, Cl. 307-157.000.

Spissinger, Friederich H.: *See*—
Wong, David L. W.; Leung, Paul C. P.; and Spissinger, Friederich H., 4,802,675, Cl. 273-310.000.

Sports Bio-Mechanics Research Inc.: *See*—
Gardiner, Roy J. W., 4,802,494, Cl. 128-779.000.

Spoto, Giuseppe: *See*—
Montino, Franco; and Spoto, Giuseppe, 4,803,064, Cl. 423-612.000.

Sprague Electric Company: *See*—
Efford, Thomas W.; and Dain, Lester C., 4,803,598, Cl. 361-541.000.

Spreen, James H.: *See*—
Gillett, John B.; and Spreen, James H., 4,803,609, Cl. 363-17.000.

Spriggs, Thomas E.: *See*—
Goode, Mark G.; Hasenberg, Daniel M.; McNeil, Thomas J.; and Spriggs, Thomas E., 4,803,251, Cl. 526-59.000.

Spruit, Abraham C.: *See*—
Schmidt, Gunter H. R.; Joge, Hans-Dieter; Sauer, Wilhelm R.; and Spruit, Abraham C., 4,802,603, Cl. 220-268.000.

SRI International: *See*—
Eckerle, Joseph S., 4,802,488, Cl. 128-672.000.

Stackhouse, Susan: *See*—
Sundelin, Kurt G. R.; Salanitro, Joseph P.; and Stackhouse, Susan, 4,803,209, Cl. 514-249.000.

Stadler, Brigitte M., heir: *See*—
Donatsch, Peter; Engel, Gunter; Hugi, Bruno; Richardson, Brian P.; Stadler, Paul A., deceased; Stadler, Hildegard R., heir; Stadler, Brigitte M., heir; Stadler, Sigrid A., heir; and Breuleux, Gerald, legal representative, 4,803,199, Cl. 514-214.000.

Stadler, Hildegard R., heir: *See*—
Donatsch, Peter; Engel, Gunter; Hugi, Bruno; Richardson, Brian P.; Stadler, Paul A., deceased; Stadler, Hildegard R., heir; Stadler, Brigitte M., heir; Stadler, Sigrid A., heir; and Breuleux, Gerald, legal representative, 4,803,199, Cl. 514-214.000.

Stadler, Paul A., deceased: *See*—
Donatsch, Peter; Engel, Gunter; Hugi, Bruno; Richardson, Brian P.; Stadler, Paul A., deceased; Stadler, Hildegard R., heir; Stadler, Brigitte M., heir; Stadler, Sigrid A., heir; and Breuleux, Gerald, legal representative, 4,803,199, Cl. 514-214.000.

Stadler, Sigrid A., heir: *See*—
Donatsch, Peter; Engel, Gunter; Hugi, Bruno; Richardson, Brian P.; Stadler, Paul A., deceased; Stadler, Hildegard R., heir; Stadler, Brigitte M., heir; Stadler, Sigrid A., heir; and Breuleux, Gerald, legal representative, 4,803,199, Cl. 514-214.000.

Stahlwerke Peine-Salzgitter AG: *See*—
Fasterding, Gunter; and Frenzel, Jurgen, 4,802,623, Cl. 238-44.000.

Stamm, Erich: *See*—
Rempfler, Hermann; Stamm, Erich; and Thummel, Rudolph C., 4,802,909, Cl. 71-92.000.

Standard Oil Company, The: *See*—
Mazanec, Terry J.; and Cable, Thomas L., 4,802,958, Cl. 204-80.000.

Standard Oil Company (Indiana), now Amoco Corp.: *See*—
Alford, Richard M., 4,803,666, Cl. 367-36.000.

Standke, Helmut, to Consolidated Controls Corporation. Thermal modulating control valvecu4,802,621, Cl. 236-93.00R.

Stanley, Ian W., to British Telecommunications public limited company. Positioning optical components and waveguidescu4,802,727, Cl. 350-96.200.

Stanley, Kerry G.; and Ho, Winston, to McNeilab, Inc. 3-aminoalkyl-1H-indole-5-urea and amide derivativescu4,803,218, Cl. 514-414.000.

Stanton, Robert. Regulated aeration of gases exhausting through a propellercu4,802,872, Cl. 440-89.000.

Stanton, Thomas H.; Clagett, James A.; Schindele, Deborah C.; Renzoni, George E.; Andersen, Niels H.; and Opheim, Kent E., to Ultra Diagnostics Corporation. Competitive immunoassay method, device and test kitcu4,803,170, Cl. 436-518.000.

Stark, Joachim: *See*—
Heine, Gerold; and Stark, Joachim, 4,802,525, Cl. 164-48.000.

Stark, Ullrich: *See*—
Yngve, Paul W.; Artzt, Peter; Egbers, Gerhard; Stark, Ullrich; and Muller, Heinz, 4,802,330, Cl. 57-238.000.

Stasz, Peter: *See*—
Noerenberg, Marc D.; and Stasz, Peter, 4,802,476, Cl. 128-303.140.

Stauffer Chemical Co.: *See*—
Baker, Don R., 4,802,912, Cl. 71-100.000.

Stautzenberger, A. Lee; and Kunkel, Robert W., to Hoechst Celanese Corporation. Purification of diphenyl phthalatescu4,803,295, Cl. 560-78.000.

STC PLC: *See—*
Norris, Andrew P.; and Smith, Martin S., 4,803,494, Cl. 343-770.000.
Willis, Gordon, 4,803,723, Cl. 379-424.000.

Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., to General Electric Company. X-ray inspection systemcu4,803,639, Cl. 364-507.000.

Steen, William M.; and Weerasinghe, Vijitha M., to Quantum Laser Corporation. Gas shroud and methodcu4,803,335, Cl. 219-121.840.

Steers, Michel; Courdille, Michel; and Hazan, Jean-Pierre, to U.S. Philips Corp. Flat-iron safety device utilizing a dual internal timing circuitcu4,803,342, Cl. 219-257.000.

Steffey, Ronald E.: *See—*
Gouldy, Thomas E.; Knoll, William C ; Ritter, Ernest R., deceased; Lynch, Thomas M.; Steffey, Ronald E.; White, Donald R.; and Brown, Robert E., 4,802,859, Cl. 439-74.000.

Steiger, Rolf; and Schellenberg, Matthias, to Ciba-Geigy AG. Photographic material for the silver dye bleach process comprising an AZO dye, capable of laking, in gelatinecu4,803,151, Cl. 430-562.000.

Steinbrecher, Jurgen K.; and Schnell, Ulrich, to U.S. Philips Corp. Method of determining the position of the tap on a resistance tele-transmittercu4,803,420, Cl. 324-64.000.

Steiner, Ronald M.: *See—*
Gilgenbach, Hubert S.; and Steiner, Ronald M., 4,802,822, Cl. 416-235.000.

Steiner, Walter. Clothes drying apparatuscu4,802,596, Cl. 211-197.000.

Steinhilber, Helmut. Desk with an additional lecterncu4,802,714, Cl. 312-196.000.

Steinijans, Volker: *See—*
Benedikt, Gerald; and Steinijans, Volker, 4,803,080, Cl. 424-488.000.

Steinmetz, Guy R.; Rule, Mark; Agreda, Victor H.; and Treece, Lanney C., to Eastman Kodak Company. Process for the co-production of aromatic carboxylates and alkyl iodidescu4,803,296, Cl. 560-80.000.

Stendel, Wilhelm: *See—*
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,803,215, Cl. 514-407.000.

Stephens, Alan, to B.H.F. (Engineering) Limited. Electrically heated forehearthcu4,803,698, Cl. 373-27.000.

Stetter, Jorg: *See—*
Brandes, Wilhelm; Reinecke, Paul; Kaspers, Helmut; Scheinpflug, Hans; and Stetter, Jorg, 4,803,214, Cl. 514-383.000.
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,803,215, Cl. 514-407.000.

Stevenson, David L.; Moore, Terry R.; and Brammall, Terrence N., to Trans-Guard Industries, Inc. Locking sealcu4,802,700, Cl. 292-327.000.

Stevenson, Robert L. Removable skirt and trouser clip for garment hangercu4,802,265, Cl. 24-335.000.

Stidd, Robert: *See—*
Reiss, James M.; Gezari, Walter; and Stidd, Robert, 4,802,462, Cl. 128-25.00R.

Stidworthy, Frederick M. Variable phase and oscillatory drivescu4,802,376, Cl. 74-394.000.

Stock, Claude: *See—*
Seinera, Henri; Luberne, Patricia; Stock, Claude; and Trouve, Patrick, 4,803,231, Cl. 523-219.000.

Stocker, Bruno: *See—*
Grobly, Walter; and Stocker, Bruno, 4,802,715, Cl. 312-299.000.

Stodt, Enno, to J. M. Voith GmbH. Change-speed gearboxcu4,802,375, Cl. 74-358.000.

Stodt, Enno, to J. M. Voith GmbH. Friction-disc clutchcu4,802,564, Cl. 192-70.280.

Stoll, John R.: *See—*
Narayan, Thirumurti; Pray, Edward R.; and Stoll, John R., 4,803,229, Cl. 521-160.000.

Stone, Steven G.: *See—*
Bachman, Wesley J.; and Stone, Steven G., 4,803,626, Cl. 364-424.070.

Stork Amsterdam B.V.: *See—*
Hermans, Willem P., 4,802,825, Cl. 416-231.00B.

Stratton, Boyd L., to Harris Corporation. Adaptive comb filtering system for processing video signalscu4,803,547, Cl. 358-31.000.

Street, Bobby D.: *See—*
DeMario, Edmund E.; and Street, Bobby D., 4,803,043, Cl. 376-442.000.

Streifer, William: *See—*
Scifres, Donald R.; Kung, Hsing; Cross, Peter; Burnham, Robert D.; and Streifer, William, 4,803,691, Cl. 372-150.000.

Strick, Nathan: *See—*
Neurath, Alexander R.; Kent, Stephen B. H.; and Strick, Nathan, 4,803,156, Cl. 435-7.000.

Stricker, Saul, to Abiomed, Inc. Intravenous drug mixing and flow devicecu4,802,650, Cl. 251-117.000.

Striebig AG: *See—*
Striebig, Ludwig, 4,802,392, Cl. 83-100.000.

Striebig, Ludwig, to Striebig AG. Method of extracting the wood dust collecting in vertical panel sawscu4,802,392, Cl. 83-100.000.

Strizhenko, Vitaly E.: *See—*
Bozhko, Valery P.; Losev, Alexei V.; Takoriants, Mateos P.; Pleshkov, Viktor I.; Strizhenko, Vitaly E.; Levityansky, Ivan A.; Filippov, Boris L.; and Kononenko, Tamara I., 4,802,654, Cl. 266-51.000.

Stryd, Thomas N. Continuous perforated paper sheet for printercu4,802,692, Cl. 281-5.000.

Studeneer, Adolf: *See—*
Wellbrock, Werner; and Studeneer, Adolf, 4,803,015, Cl. 260-402.000.

Stuhrmann, Heinz: *See—*
Schwarz, Reinhard; Stuhrmann, Heinz; and Nobis, Dieter, 4,802,384, Cl. 74-745.000.

Styles, George R.; Jones, K. Tom; and Bloom, Devin A., to Pacific BioSystems, Inc. Cyclically varying pulsating fluid supply systemcu4,802,508, Cl. 137-624.130.

Suda, Koichiro: *See—*
Utoh, Yoshihiro; and Suda, Koichiro, 4,803,724, Cl. 379-433.000.

Suda, Shigeyuki: *See—*
Baba, Takeshi; Suda, Shigeyuki; Nose, Noriyuki; Kawakami, Eigo; Nakajima, Toshiyuki; and Kushibiki, Nobuo, 4,802,746, Cl. 350-418.000.

Suda, Shinji: *See—*
Yamanaka, Motosuke; Miyake, Kazutoshi; Suda, Shinji; Ohhara, Hideto; and Ogawa, Toshiaki, 4,803,276, Cl. 546-121.000.

Suda, Yoshiyuki: *See—*
Saito, Tamio; Takayama, Satoshi; Suda, Yoshiyuki; Shimada, Osamu; and Mori, Ken-ichi, 4,803,375, Cl. 250-578.000.

Suefuji, Kazutaka; Kaneda, Aizo; Kanai, Yasuyuki; Nakamura, Shozo; Arata, Tetsuya; Kikuchi, Katsuaki; Senshu, Takao; Nakakado, Kimiaki; Maeda, Eiji; and Minakawa, Sadatsohi, to Hitachi, Ltd. Fluid machine with resin-coated scroll memberscu4,802,831, Cl. 418-55.000.

Sugahara, Youji; and Matsumura, Hideyuki, to Omron Tateisi Electronics Co. Automatic transaction machinecu4,803,347, Cl. 235-379.000.

Sugano, Shozo: *See—*
Yamamoto, Masanori; Kamoda, Tamotsu; Nakahara, Makoto; Fujii, Yoshimasa; and Sugano, Shozo, 4,803,088, Cl. 426-107.000.

Sugimori, Shuighi; and Kawamura, Tomihiko, to Mitsubishi Rayon Company Ltd. Porous water-treating materialcu4,802,985, Cl. 210-502.100.

Sugimoto, Kenichi: *See—*
Yamaguchi, Keizaburo; Oikawa, Hideaki; Sugimoto, Kenichi; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,803,258, Cl. 528-211.000.

Sugimoto, Masahiro; and Wakasugi, Yasumasa, to Fujitsu Limited. Heatsink package for flip-chip ICcu4,803,546, Cl. 357-81.000.

Sugimoto, Osamu; and Watabe, Masayuki, to Kabushiki Kaisha Nippon Coinco. Card read/write devicecu4,803,349, Cl. 235-475.000.

Sugimoto, Yuji; Tsuji, Masaru; and Yoshiura, Shoichiro, to Sharp Kabushiki Kaisha. Pressure applying mechanism for fixing rollers of a copying apparatuscu4,802,439, Cl. 118-116.000.

Sugisaki, Takashi: *See—*
Maruhashi, Yoshitsugu; Iida, Setsuko; Sugisaki, Takashi; Mizutani, Yohji; and Kishida, Nobuhiro, 4,803,036, Cl. 264-526.000.

Sugiura, Noboru: *See—*
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Sugiyama, Kengo: *See—*
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Suld, George: *See—*
Lyons, James E.; Ellis, Paul E., Jr.; Myers, Harry K., Jr.; Suld, George; and Langdale, Wayne A., 4,803,187, Cl. 502-200.000.

Sullins, Harry P., to Richland Industrial, Inc. Method for coating pipe with refractory materialcu4,802,940, Cl. 156-187.000.

Sullivan, James C.; and Epperly, William R., to Fuel Tech, Inc. Process for the reduction of nitrogen oxides in an effluent using a hydroxy amino hydrocarboncu4,803,059, Cl. 423-235.000.

Sullivan, Patrick J.: *See—*
Bowen, John M.; Sullivan, Patrick J.; Blanche, M. Sterling; Essington, Michael; and Noe, Lewis J., 4,802,761, Cl. 356-301.000.

Sumida, Shuji: *See—*
Iida, Yoshimitsu; Terazono, Takashi; and Sumida, Shuji, 4,803,213, Cl. 514-355.000.

Sumitani, Shigeto; Noguchi, Haruo; and Araya, Hiroyuki, to Kabushiki Kaisha Toshiba. Refrigerant-heating type heating apparatuscu4,802,529, Cl. 165-29.000.

Sumitiomo Chemical Company, Limited: *See—*
Kojimoto, Susumu; Nii, Fumio; and Mori, Toshio, 4,802,305, Cl. 47-57.600.

Sumitomo Chemical Company, Limited: *See—*
Nagasaki, Hideo; and Takemoto, Yasuzi, 4,803,250, Cl. 525-329.300.
Okada, Toyokazu; Higashi, Koji; and Taguchi, Satoshi, 4,802,745, Cl. 350-397.000.
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Takemoto, Ichiki, 4,803,270, Cl. 544-105.000.

Sumitomo Electric Industries, Ltd.: *See—*
Fukuma, Masumi; and Akasaka, Nobuhiro, 4,802,732, Cl. 350-96.230.

Sumitomo Metal Industries, Ltd.: *See*—
Yamada, Tsuneo; Sakashita, Tsutomu; Tomono, Hiroshi; Kimura, Takashi; Machara, Yasuhiro; and Yasumoto, Kunio, 4,802,356, Cl. 72-184.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Kitaoh, Katsutoshi, 4,802,674, Cl. 273-235.00A.
Nakasaki, Eiji, 4,802,547, Cl. 180-216.000.
Sumiya, Kenji: *See*—
Takeuchi, Yoji; and Sumiya, Kenji, 4,803,125, Cl. 428-411.100.
Sumpman, Wayne C.: *See*—
Nathenson, Richard D.; Alexion, Christopher C.; and Sumpman, Wayne C., 4,802,531, Cl. 165-104.280.
Sun Microsystems, Inc.: *See*—
Kelly, Edmund J., 4,803,621, Cl. 364-200.000.
Sun Refining and Marketing Company: *See*—
Lyons, James E.; Ellis, Paul E., Jr.; Myers, Harry K., Jr.; Suld, George; and Langdale, Wayne A., 4,803,187, Cl. 502-200.000.
Sundberg, Michael W.; Babb, Bruce; and McClune, Gregory, to Eastman Kodak Company. Hydrolyzable fluorescent substrates for phosphatases and analytical use thereofcu4,803,157, Cl. 435-21.000.
Sundelin, Kurt G. R.; Salanitro, Joseph P.; and Stackhouse, Susan, to International Minerals & Chemical Corp. Substituted 2,3-diphenyl-1,2-dihydroquinoxalinescu4,803,209, Cl. 514-249.000.
Sundstrand Corporation: *See*—
Tyler, Thomas R., 4,802,817, Cl. 415-157.000.
Sunpower, Inc.: *See*—
Beale, William T., 4,802,332, Cl. 60-520.000.
Suntory Limited: *See*—
Ohfune, Yasufumi; and Sakaitani, Masahiro, 4,803,292, Cl. 560-29.000.
Sunwell Engineering Company Ltd.: *See*—
Goldstein, Vladimir L., 4,802,530, Cl. 165-94.000.
Susa, Kenzo: *See*—
Kushida, Keiko; Takeuchi, Hiroshi; Kobayashi, Toshio; Takagi, Kazumasa; and Susa, Kenzo, 4,803,392, Cl. 310-311.000.
Sutoh, Hiroki; and Sawada, Kenji, to Alps Electric Co., Ltd. Support structure for rockable conductive plate in a seesaw-type switchcu4,803,317, Cl. 200-438.000.
Sutter, Werner: *See*—
Frei, Matthias; Mueller, Willi; and Sutter, Werner, 4,803,325, Cl. 219-64.000.
Suyama, Toshihisa: *See*—
Takematsu, Tetsuo; Kato, Shozo; Ishizaki, Masahiko; and Suyama, Toshihisa, 4,802,907, Cl. 71-90.000.
Suzuki, Akira: *See*—
Inayoshi, Hideo; Suzuki, Akira; Tsubosaki, Kunihiro; Ueda, Toyoichi; Makino, Daisuke; Ichimura, Nobuo; and Suzuki, Kazunari, 4,803,543, Cl. 357-72.000.
Suzuki, Hirofumi: *See*—
Hoshizaki, Hiroki; Oyobe, Kazuo; Suzuki, Hirofumi; Kawahara, Nobuaki; Niwa, Hitoshi; and Kageyama, Terutaka, 4,803,345, Cl. 219-553.000.
Suzuki, Hiromasa: *See*—
Yabe, Hisao; Kimura, Kenji; Kanno, Masahide; Tsuji, Kiyoshi; Yoshinaga, Jun; Yokoi, Takeshi; Ozeki, Kazuhiko; Nishigaki, Shinichi; Nakamura, Takeaki; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,803,550, Cl. 358-98.000.
Suzuki, Hiroshi: *See*—
Uematsu, Takao; Suzuki, Hiroshi; Komatsuzaki, Shigeki; and Nakano, Fumio, 4,803,000, Cl. 252-32.500.
Suzuki, Katsumi: *See*—
Kobayashi, Tadashi; Suzuki, Katsumi; and Nakamura, Naomasa, 4,803,660, Cl. 365-113.000.
Suzuki, Kazuhiro: *See*—
Yamane, Kazuo; Mori, Masakazu; Tsuda, Takashi; Ohkuma, Yoshinori; and Suzuki, Kazuhiro, 4,803,384, Cl. 307-490.000.
Suzuki, Kazunari: *See*—
Inayoshi, Hideo; Suzuki, Akira; Tsubosaki, Kunihiro; Ueda, Toyoichi; Makino, Daisuke; Ichimura, Nobuo; and Suzuki, Kazunari, 4,803,543, Cl. 357-72.000.
Suzuki, Kenji; Takagi, Toshiyuki; and Nishi, Tomoya, to Hitachi, Ltd. Memory control systemcu4,803,653, Cl. 364-900.000.
Suzuki, Masanobu: *See*—
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Suzuki, Seikou: *See*—
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Suzuki, Shigeru: *See*—
Matsumoto, Kazuyoshi; Miyakawa, Seiichi; Ohdake, Eishu; and Suzuki, Shigeru, 4,803,593, Cl. 361-225.000.
Suzuki, Shun: *See*—
Shinohara, Shigeru; and Suzuki, Shun, 4,803,410, Cl. 318-331.000.
Suzuki, Tadashi: *See*—
Tomosada, Masahiro; Ogawa, Hiroshi; Tohyama, Yoshikuni; Adachi, Hideki; Suzuki, Tadashi; and Ohki, Naoyuki, 4,803,520, Cl. 355-7.000.
Suzuki, Tamotsu; Shinozaki, Fumiaki; Nishioka, Akira; and Totsuka, Mikio, to Fuji Photo Film Co., Ltd. Light sensitive alkali developable photoresist material with fluorine surfactant containing color layercu4,803,145, Cl. 430-166.000.
Suzuki, Yasuo: *See*—
Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Orimo, Masayuki; Koizumi, Minoru; Kasajima, Hirokazu; and Nakai, Kozou, 4,803,683, Cl. 371-19.000.
Svecia Silkscreen Maskiner AB: *See*—
Ericsson, Sylve J. D., 4,802,410, Cl. 101-124.000.
Svenka, Konrad: *See*—
Kegler, Ernst; Svenka, Konrad; and Thierauf, Klaus, 4,803,569, Cl. 360-60.000.
Svensen, Bjorn: *See*—
Nichols, Nancie L.; and Svensen, Bjorn, 4,803,604, Cl. 362-154.000.
Svenska Rotor Maskiner AB: *See*—
Oscarsson, Johnny, 4,802,457, Cl. 123-564.000.
Svensson, E. Gunnar, to Autopart Sweden AB. Sun visor with illuminated mirrorcu4,803,602, Cl. 362-135.000.
Svoma, Rodney A. Sports racketcu4,802,678, Cl. 273-73.00D.
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Champlin, George B.; and Swan, Charles F., 4,802,398, Cl. 87-8.000.
Swanberg, Melvin E., to Xerox Corporation. Multi-phase printed circuit board tachometercu4,803,425, Cl. 324-173.000.
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SWF Auto-Electric GmbH: *See*—
Edele, Reinhard; and Schmid, Eckhardt, 4,802,257, Cl. 15-250.320.
Swihart, Terence J.: *See*—
Narula, Dipak; and Swihart, Terence J., 4,803,233, Cl. 524-58.000.
Swiss Aluminium Ltd.: *See*—
Brockmeyer, Jerry W., 4,803,025, Cl. 264-63.000.
Crona, Theodore J.; Bichsel, Heinz; and Timm, Jurgen, 4,802,935, Cl. 148-437.000.
Swiss Aluminum: *See*—
Bretschneider, Gerd; and Kiesewetter, Dieter, 4,802,600, Cl. 220-1.500.
Swiss Aluminum Ltd.: *See*—
Brockmeyer, Jerry W.; and Cummings, Michael A., 4,802,527, Cl. 164-358.000.
Syntex (U.S.A.) Inc.: *See*—
Hsiao, Charles H.; and Kent, John S., 4,803,079, Cl. 424-468.000.
Muchowski, Joseph M.; Greenhouse, Robert J.; and Guzman, Angel, 4,803,269, Cl. 544-69.000.
Verheyden, Julien P. H.; and Martin, John C., 4,803,271, Cl. 544-276.000.
Szyms, Walter, to Armstrong Rubber Co., The. Belt and tread transfer ring and drum expand bladderscu4,802,337, Cl. 156-118.000.
Ta, S. Henry. Electronic multi-purpose warning device for motor vehicles and motor boatscu4,803,459, Cl. 340-52.00R.
Tabata, Kazufumi: *See*—
Kashiwaya, Kunio; Haga, Hiroyo; Saeki, Nobuo; Yabuki, Youichi; Ozoe, Kuniyuki; Fukushima, Shinichi; and Tabata, Kazufumi, 4,802,270, Cl. 29-241.000.
Tabor, Jim; and Counts, Richard, to Prescolite, Inc. Voltage control modulecu4,803,586, Cl. 361-18.000.
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Tada, Eichi: *See*—
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Tada, Haruo: *See*—
Funabashi, Takanori; Nakada, Akiyoshi; and Tada, Haruo, 4,802,815, Cl. 414-680.000.
Tada, Tetsuya; Nagasaka, Masumi; Tabuchi, Hiroaki; and Terstani, Tatsuo, to Toyota Jidosha Kabushiki Kaisha. Cruise control system for a vehiclecu4,803,637, Cl. 364-426.040.
Taguchi, Masahiro: *See*—
Onimaru, Sadahisa; Shimogawa, Toshiaki; Taguchi, Masahiro; and Kuwakado, Satosi, 4,802,706, Cl. 296-68.000.
Taguchi, Masao, to Fujitsu Limited. Dynamic random access memory trench capacitorcu4,803,535, Cl. 357-23.600.
Taguchi, Satoshi: *See*—
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Taguchi, Shinji; and Tango, Hiroyuki. Semiconductor integrated circuit formed on an insulator substratecu4,803,530, Cl. 357-23.700.
Taguchi, Toshimichi, to Sharp Kabushiki Kaisha. Printed circuit boardcu4,803,308, Cl. 174-68.500.
Tai, Henry T. H.: *See*—
Risman, Owen R.; and Tai, Henry T. H., 4,802,879, Cl. 446-175.000.
Tailhades, Philippe: *See*—
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Taisho Pharmaceutical Co., Ltd.: *See*—
Kawashima, Yutaka; Satoh, Masakazu; Hatada, Yuichi; Hazato, Fumiko; Nakashima, Yoshimoto; and Sota, Kaoru, 4,803,266, Cl. 540-200.000.
Tajima, Eiji: *See*—
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Takabayashi, Yutaka: *See*—
Togino, Takayoshi; Fujiwara, Hiroshi; Takabayashi, Yutaka; Nagano, Takashi; Fukaya, Takashi; Minami, Kazuyuki; and Tsunoda, Toshiyuki, 4,802,749, Cl. 350-516.000.
Takada, Masaaki, to Kabushiki Kaisha Toshiba. Platen fixing apparatuscu4,802,795, Cl. 400-660.000.

Takagi, Kazumasa: *See*—
Kushida, Keiko; Takeuchi, Hiroshi; Kobayashi, Toshio; Takagi, Kazumasa; and Susa, Kenzo, 4,803,392, Cl. 310-311.000.

Takagi, Seiichi; and Fukumoto, Hiroshi, to Canon Kabushiki Kaisha. Containing magnetic particles having a bulk resistivity of at most 10^4 ohm.cm and a powder resistivity of 10^5-10^{12} ohm.cmcu4,803,142, Cl. 430-106.600.

Takagi, Tadashi; Seino, Kiyoharu; and Takeda, Fumio, to Mitsubishi Denki Kabushiki Kaisha. Microwave power combining FET amplifiercu4,803,443, Cl. 330-277.000.

Takagi, Toshiyuki: *See*—
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Takahashi, Fumito, to Fuji Electric Co., Ltd. Proximity switchcu4,803,444, Cl. 331-65.000.

Takahashi, Hideaki: *See*—
Hirata, Tadashi; Koyama, Katsumi; Takahashi, Hideaki; Harashima, Yasuhiro; Kitahara, Michio; Igarashi, Katsuyuki; Kitamura, Jun; Kikuchi, Hiroshi; and Narisada, Kimiyuki, 4,803,372, Cl. 250-561.000.

Takahashi, Kazuto: *See*—
Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, 4,803,572, Cl. 360-60.000.

Takahashi, Kiyoh, to NEC Corporation. Data transmission control systemcu4,803,681, Cl. 370-85.000.

Takahashi, Kiyoshi; and Okada, Hisaki, to Brother Kogyo Kabushiki Kaisha. Carriage drive control device in a printing devicecu4,802,778, Cl. 400-624.000.

Takahashi, Kiyotaka: *See*—
Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, 4,803,572, Cl. 360-60.000.

Takahashi, Koji: *See*—
Kashida, Motokazu; Masui, Toshiyuki; Fukatsu, Tsutomu; Takahashi, Koji; Takei, Masahiro; and Nagasawa, Kenichi, 4,803,570, Cl. 360-61.000.

Takahashi, Masaatsu, to Diesel Kiki Co., Ltd. Mechanical governor for fuel injection pump, with reaction force adjusting mechanism for governor control levercu4,802,451, Cl. 123-373.000.

Takahashi, Masakatsu: *See*—
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Takahashi, Masamitsu, to Bankoku Needle Manufacturing Co., Ltd. Needle casecu4,802,581, Cl. 206-380.000.

Takahashi, Masatoshi: *See*—
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Takahashi, Sadao, to Hitachi, Ltd. Mass spectrometercu4,803,355, Cl. 250-288.000.

Takahashi, Takeshi, to Toyota Jidosha Kabushiki Kaisha. Piezoelectric actuatorcu4,803,393, Cl. 310-328.000.

Takahashi, Toshiro; Kuwabara, Ken-ichi; and Okada, Masahiro, to Fuji Photo Film Co., Ltd. Silver halide photographic materialscu4,803,149, Cl. 430-264.000.

Takahashi, Toyohiko: *See*—
Kobayashi, Yukio; Takeuchi, Masataka; Kameyama, Mutsumi; Ohira, Manabu; Kikuta, Yoshikazu; and Takahashi, Toyohiko, 4,803,138, Cl. 429-194.000.

Takahaski, Yoshinori: *See*—
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Okamoto, Isao; Terada, Katsuyuki; Go, Hiromi; Sebata, Michio; Higaki, Hiroshi; and Takai, Hideo, 4,802,418, Cl. 105-167.000.

Takanaka, Toshimasa: *See*—
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Amano, Jiro; Shimada, Masato; Takano, Kouzou; and Tohyama, Shunroku, 4,803,116, Cl. 428-286.000.

Takao, Hideaki; Motoi, Taiko; Sekimura, Nobuyuki; Kamio, Masaru; and Murata, Tatsuo, to Canon Kabushiki Kaisha. Liquid crystal device having color filters wherein the color filters formed from a polyamino resin containing coloring materialscu4,802,743, Cl. 350-339.00F.

Takashima, Masanobu: *See*—
Saeki, Keiso; Takashima, Masanobu; and Iwakura, Ken, 4,803,192, Cl. 503-212.000.

Takata, Hirotoshi, to Nippon Seiko Kabushiki Kaisha. Roller bearingcu4,802,775, Cl. 384-450.000.

Takayama, Naoto; Tsunekawa, Yuzo; and Kitamura, Kazumi, to Fuji Photo Film Co., Ltd. Grease applying methodcu4,802,554, Cl. 184-14.000.

Takayama, Satoshi: *See*—
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Saito, Tamio; Takayama, Satoshi; Suda, Yoshiyuki; Shimada, Osamu; and Mori, Ken-ichi, 4,803,375, Cl. 250-578.000.

Takeda Chemical Industries, Ltd.: *See*—
Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, 4,803,303, Cl. 564-462.000.
Kanamaru, Tsuneo; Shinagawa, Susumu; and Muroi, Masayuki, 4,803,275, Cl. 546-116.000.

Takeda, Fumio: *See*—
Takagi, Tadashi; Seino, Kiyoharu; and Takeda, Fumio, 4,803,443, Cl. 330-277.000.

Takeda, Kunihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Continuous chromatographic separation of uranium isotopescu4,803,057, Cl. 423-6.000.

Takei, Masahiro: *See*—
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Kozuki, Susumu; Takei, Masahiro; Masui, Toshiyuki; Hirasawa, Masahide; and Kashida, Motokazu, 4,803,684, Cl. 371-31.000.

Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory device having redundancy circuit portioncu4,803,656, Cl. 365-200.000.

Takematsu, Tetsuo; Kato, Shozo; Ishizaki, Masahiko; and Suyama, Toshihisa, to Tokuyama Soda Kabushiki Kaisha. N-substituted chloroacetanilides processes for production thereof, and herbicidal composition comprising the samecu4,802,907, Cl. 71-90.000.

Takemoto, Ichiki, to Sumitomo Chemical Company, Limited. Process of producing fluoroaniline derivativescu4,803,270, Cl. 544-105.000.

Takemoto, Tadashi: *See*—
Hijiya, Toyoto; Takemoto, Tadashi; and Yukawa, Toshihide, 4,803,300, Cl. 562-450.000.

Takemoto, Yasuzi: *See*—
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Takemura, Tohru; Itoh, Hajime; Kamo, Jun; and Yoshida, Haruhiko, to Mitsubishi Rayon Co., Ltd. Method of making multilayer composite hollow fiberscu4,802,942, Cl. 156-244.130.

Takenaka, Shinji: *See*—
Itoh, Hiroyuki; Kono, Yoshitsugu; Ajioka, Masanobu; Takenaka, Shinji; and Kataita, Masafumi, 4,803,065, Cl. 423-502.000.

Takeuchi, Hiroshi: *See*—
Kushida, Keiko; Takeuchi, Hiroshi; Kobayashi, Toshio; Takagi, Kazumasa; and Susa, Kenzo, 4,803,392, Cl. 310-311.000.

Takeuchi, Masataka: *See*—
Kobayashi, Yukio; Takeuchi, Masataka; Kameyama, Mutsumi; Ohira, Manabu; Kikuta, Yoshikazu; and Takahashi, Toyohiko, 4,803,138, Cl. 429-194.000.

Takeuchi, Yasuhito: *See*—
Sano, Shinichi; Takeuchi, Yasuhito; Tamezumi, Yoshiro; Higashiizumi, Takao; and Kakizawa, Tsuyoshi, 4,803,486, Cl. 340-825.790.

Takeuchi, Yoji; and Sumiya, Kenji, to Hitachi Maxell, Ltd. Magnetic recording mediumcu4,803,125, Cl. 428-411.100.

Takewa, Hiroyuki: *See*—
Murata, Kousaku; Takayama, Satoshi; Takewa, Hiroyuki; Saiki, Shuji; and Tanaka, Tsuneo, 4,803,242, Cl. 524-35.000.

Takiguchi, Haruhisa, Kaneiwa, Shinji; Yoshida, Toshihiko; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Semiconductor lasercu4,803,690, Cl. 372-45.000.

Takimura, Keisuke: *See*—
Katayama, Nobuaki; Sasaki, Kan; Koide, Takeharu; and Takimura, Keisuke, 4,802,383, Cl. 74-711.000.

Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; and Ohtagaki, Shigeki, to Mitsubishi Denki Kabushiki Kaisha. Vehicle height control systemcu4,803,630, Cl. 364-424.050.

Takoriants, Mateos P.: *See*—
Bozhko, Valery P.; Losev, Alexei V.; Takoriants, Mateos P.; Pleshkov, Viktor I.; Strizhenko, Vitaly E.; Levityansky, Ivan A.; Filippov, Boris L.; and Kononenko, Tamara I., 4,802,654, Cl. 266-51.000.

Tallquist, Kenneth M.: *See*—
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Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Heat-sensitive recording papercu4,803,191, Cl. 503-200.000.

Tamai, Yasuo: *See*—
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Tamamura, Hideo: *See*—
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Tamasi, Piroska: *See*—
Kekesi, Sandor; Tamasi, Piroska; Pal, Veronika; Jancso, Sandor; Kristof nee Szvitil, Ilona; Bacsa, Gyorgy; and Kovacs nee Hadady, Katalin, 4,803,069, Cl. 424-74.000.

Tamezumi, Yoshiro: *See*—
Sano, Shinichi; Takeuchi, Yasuhito; Tamezumi, Yoshiro; Higashiizumi, Takao; and Kakizawa, Tsuyoshi, 4,803,486, Cl. 340-825.790.

Tampoflex GmbH: *See*—
Berberich, Bernd; and Reinhold, Holger, 4,802,565, Cl. 198-345.000.

Tanaka, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Device for controlling ignition timing in internal combustion enginecu4,802,454, Cl. 123-425.000.

Tanaka, Hirotoshi: *See*—
Hatta, Yasushi; Mitsusada, Kazumichi; Tanaka, Hirotoshi; and Hayashi, Takehisa, 4,803,527, Cl. 357-13.000.

Tanaka, Kenichi, to Sharp Kabushiki Kaisha. EEPROM cellcu4,803,662, Cl. 365-185.000.

Tanaka, Kimio; and Shiba, Haruo, to TDK Corporation. Disc cartridgecu4,803,678, Cl. 369-291.000.

Tanaka, Shoichi, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Apparatus for treating thermoplastic resincu4,802,769, Cl. 366-75.000.

Tanaka, Toshiaki: *See*—
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Tanaka, Tsuneo: *See*—
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Tango, Hiroyuki: *See*—
Taguchi, Shinji; and Tango, Hiroyuki, 4,803,530, Cl. 357-23.700.
Taniguchi, Motoya: *See*—
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Taniguchi, Nobuyuki: *See*—
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Tanimoto, Hiroshi; and Hayashibara, Mikio, to Kabushiki Kaisha Toshiba. Voltage comparator circuitcu4,803,382, Cl. 307-362.000.
Tankersley, Robert W., Jr.: *See*—
Munson, Harry R., Jr.; and Tankersley, Robert W., Jr., 4,803,200, Cl. 514-231.200.
Tanner, Cynthia L.: *See*—
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., 4,802,943, Cl. 156-244.230.
Tappe, Horst: *See*—
Bte, Ulrich, ml/u/ hler; Tappe, Horst; Kuhn, Reinhard; Bode, Albert; and Boss, Margareta, 4,802,889, Cl. 8-639.000.
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Tateno, Hiroki: *See*—
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Tatung-Conair Corporation: *See*—
Chen, Shye L., 4,802,287, Cl. 34-91.000.
Taylor, Clive: *See*—
Hays, Brian; and Taylor, Clive, 4,802,538, Cl. 173-1.000.
Taylor, Stephen C., to Dicon Systems Limited. Transmitter covercu4,803,473, Cl. 340-693.000.
TDK Corporation: *See*—
Ezaki, Joichiro; and Fukuda, Kazumasa, 4,803,577, Cl. 360-102.000.
Odagawa, Yoshimoto; Yanagisawa, Yasushi; and Imaizumi, Hiraku, 4,803,426, Cl. 324-207.000.
Tanaka, Kimio; and Shiba, Haruo, 4,803,678, Cl. 369-291.000.
TEAC Corporation: *See*—
Yamaguchi, Hirohisa; Usami, Horoshi; Nagai, Tadao; and Mashimo, Akira, 4,803,677, Cl. 369-44.000.
Tecalemit Flexibles S.A.: *See*—
Berlincourt, Yves; and Mouchot, Alain, 4,802,510, Cl. 138-125.000.
Teckknowledge, Inc.: *See*—
Hardy, Steven; and Joyce, Robert H., 4,803,641, Cl. 364-513.000.
Tecnol, Inc.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,802,473, Cl. 128-206.190.
Teepak, Inc.: *See*—
Hensley, Norman G., 4,802,511, Cl. 138-118.100.
Tektronix, Inc.: *See*—
Riley, Larry D.; and Heidtmann, Denis L., 4,803,531, Cl. 357-24.000.
Telefonaktiebolaget L M Ericsson: *See*—
Persson, Sven A. R., 4,802,722, Cl. 350-96.100.
Tenggvist, Lennart: *See*—
Atterby, Fred; Voss-Schrader, Bertil; and Tenggvist, Lennart, 4,802,421, Cl. 108-51.100.
Tenmyo, Osamu; Ohkuma, Hiroaki; and Konishi, Masataka, to Bristol-Myers Company. Antiviral antibiotic complexcu4,803,224, Cl. 514-563.000.
Tenneco Canada Inc.: *See*—
Lipsztajn, Marek, 4,802,959, Cl. 204-82.000.
Terada, Katsuyuki: *See*—
Okamoto, Isao; Terada, Katsuyuki; Go, Hiromi; Sebata, Michio; Higaki, Hiroshi; and Takai, Hideo, 4,802,418, Cl. 105-167.000.
Terada, Toshiyuki; Hirose, Mayumi; and Ishida, Kenji, to Kabushiki Kaisha Toshiba. Schottky gate field effect transistor and manufacturing methodcu4,803,526, Cl. 357-15.000.
Terao, Kazuo: *See*—
Teshigawara, Toru; Terao, Kazuo; and Watanabe, Hiroshi, 4,803,565, Cl. 358-300.000.
Teraoka, Hidetoshi: *See*—
Koyama, Motoyasu; Teraoka, Hidetoshi; Akagi, Takao; Yamaguchi, Shinji; Sakamoto, Itsuki; Namba, Akira; and Okagaki, Isao, 4,803,332, Cl. 219-121.520.
Teratani, Tatsuo: *See*—
Tada, Tetsuya; Nagasaka, Masumi; Tabuchi, Hiroaki; and Teratani, Tatsuo, 4,803,637, Cl. 364-426.040.
Terazono, Takashi: *See*—
Iida, Yoshimitsu; Terazono, Takashi; and Sumida, Shuji, 4,803,213, Cl. 514-355.000.
Terrasse, Joseph J.; Boucher, Andre; and Seux, Michel, to Chavanne - Ketin. Hoops for continuous casting rollscu4,802,528, Cl. 164-428.000.
Terzian, Rouben T.; and Wozniak, Walter J., to Marvin Glass & Associates. Doll with rotating and bendable armscu4,802,878, Cl. 446-300.000.
Teshigawara, Toru; Terao, Kazuo; and Watanabe, Hiroshi, to Fuji Xerox Co., Ltd.; and Futaba Corporation. Optical write headcu4,803,565, Cl. 358-300.000.
Testing Machines Inc.: *See*—
Bachleider, Walter P.; Frankel, Maurice; and Fiore, Peter, 4,802,366, Cl. 73-799.000.
Texaco Inc.: *See*—
Bartels, Craig R.; and Reale, John, Jr., 4,802,988, Cl. 210-640.000.
Bussian, Alfred E.; Williams, Thomas M.; Carmichael, Paul D.; and Papp, Hans J., 4,802,361, Cl. 73-61.10R.
Najjar, Mitri S.; and Becker, Michael W., 4,803,061, Cl. 423-415.00A.
Sanderson, John R.; Marquis, Edward T.; and Lin, Jiang-Jen, 4,803,305, Cl. 568-571.000.
Texas Instruments Incorporated: *See*—
Hester, Richard K.; and de Wit, Michiel, 4,803,462, Cl. 341-172.000.
Lewis, Adam J.; and Frensley, William R., 4,803,537, Cl. 357-30.000.
Sheerer, Thomas J., 4,802,781, Cl. 400-124.000.
Th. Goldschmidt AG: *See*—
Ruf, Erich, 4,803,099, Cl. 427-314.000.
The Furukawa Electric Co., 03, Ltd.: *See*—
Sotani, Junji; Koizumi, Tatsuya; Endo, Shiro; Mashino, Nobuyoshi; and Seo, Susumu, 4,803,343, Cl. 219-326.000.
Thekdi, Arvind C.: *See*—
Kuhn, Timothy J.; Bender, James W.; and Thekdi, Arvind C., 4,802,844, Cl. 432-126.000.
Thermo Electron-Web Systems, Inc.: *See*—
Dunlap, Harold E., 4,802,928, Cl. 134-15.000.
Thermo King Corporation: *See*—
Gustafson, Alan D.; and Unger, Richard F., 4,802,342, Cl. 62-239.000.
Theus, Ulrich: *See*—
Giebel, Burkhard; and Theus, Ulrich, 4,803,657, Cl. 365-221.000.
Thiele, Klaus: *See*—
Ploog, Uwe; Busch, Peter; Thiele, Klaus; Hoffkes, Horst; and Giede, Karl, 4,803,068, Cl. 424-70.000.
Thiem, Joachim; Deger, Hans-Matthias; Fritsche-Lang, Wolfram; and Kreuzer, Matthias, to Hoechst Aktiengesellschaft. Process for the preparation of alkylated glycosyl fluorides free from hydroxyl groupscu4,803,263, Cl. 536-18.600.
Thierauf, Klaus: *See*—
Kegler, Ernst; Svenka, Konrad; and Thierauf, Klaus, 4,803,569, Cl. 360-60.000.
Thomas Industries, Inc.: *See*—
Carson, Douglas W., 4,803,603, Cl. 362-150.000.
Thomas, Thomas J.: *See*—
Sandefur, Charles W.; and Thomas, Thomas J., 4,802,888, Cl. 8-524.000.
Thompson, David M.: *See*—
Ball, Keith R.; and Thompson, David M., 4,802,900, Cl. 55-381.000.
Thompson, Peter: *See*—
Pijanowski, Stefan; Thompson, Peter; and Dartnall, Adrian, 4,802,601, Cl. 220-4.00R.
Thompson, Philip W.: *See*—
Kenney, Andrew C.; Thompson, Philip W.; and Harris, John L., 4,802,981, Cl. 210-198.200.
Thompson, Richard D: *See*—
Psaras, Peter A.; Tu, King-Ning; and Thompson, Richard D, 4,803,539, Cl. 357-67.000.
Thomson, David L., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Fast significant sample detection for a pitch detectorcu4,803,730, Cl. 381-49.000.
Thornthwaite, Ian R., to Lucas Industries Public Limited Company. Fuel injection pumpcu4,802,453, Cl. 123-450.000.
Thummel, Rudolph C.: *See*—
Rempfler, Hermann; Stamm, Erich; and Thummel, Rudolph C., 4,802,909, Cl. 71-92.000.
Thurner, Elmar, to Hilti Aktiengesellschaft. Attachment unit including nail and sleevecu4,802,802, Cl. 411-107.000.
Tierney, Mark D.: *See*—
Smart, Jerome T.; and Tierney, Mark D., 4,802,613, Cl. 224-204.000.
Tietjens, Eduard W., to U.S. Philips Corp. Dry shaving apparatuscu4,802,281, Cl. 30-43.600.
Tiger Electronics, Inc.: *See*—
Risman, Owen R.; and Tai, Henry T. H., 4,802,879, Cl. 446-175.000.
Timberg, Lloyd M.: *See*—
Victorovich, Grigori S.; Diaz, Carlos M.; O'Neill, Charles E.; Bell, James A. E.; and Timberg, Lloyd M., 4,802,916, Cl. 75-24.000.
Timm, Jurgen: *See*—
Crona, Theodore J.; Bichsel, Heinz; and Timm, Jurgen, 4,802,935, Cl. 148-437.000.
Tinely, Edward J.: *See*—
Hodgson, Philip K. G.; McShea, Julie A.; and Tinely, Edward J., 4,802,973, Cl. 208-207.000.
Tirkel, Anatol Z.: *See*—
Pilbrow, John R.; Troup, Gordon J. F.; Tirkel, Anatol Z.; Hutton, Donald R.; Gruner, Lucian; and McLaren, Neil R., 4,803,624, Cl. 324-316.000.
Tobita, Hideaki: *See*—
Naruse, Kazuo; Kitano, Mikio; and Tobita, Hideaki, 4,802,616, Cl. 228-4.100.

Tobita, Takashi: *See*—
Kitamura, Satoshi; Tobita, Takashi; Kanazawa, Motoki; and Shizuki, Masahiro, 4,803,288, Cl. 549-267.000.
Toda, Hiroaki: *See*—
Saji, Yoshiro; Tada, Eichi; Toda, Hiroaki; and Kawahara, Yoshiaki, 4,803,452, Cl. 335-301.000.
Todd, Richard S.: *See*—
White, Alan C.; Cliffe, Ian A.; and Todd, Richard S., 4,803,207, Cl. 514-267.000.
Todokoro, Hideo: *See*—
Shinada, Hiroyuki; Todokoro, Hideo; and Fukuhara, Satoru, 4,803,430, Cl. 324-250.000.
Togino, Takayoshi; Fujiwara, Hiroshi; Takabayashi, Yutaka; Nagano, Takashi; Fukaya, Takashi; Minami, Kazuyuki; and Tsunoda, Toshiyuki, to Olympus Optical Co., Ltd. Surgical microscopecu4,802,749, Cl. 350-516.000.
Tohyama, Shunroku: *See*—
Amano, Jiro; Shimada, Masato; Takano, Kouzou; and Tohyama, Shunroku, 4,803,116, Cl. 428-286.000.
Tohyama, Yoshikuni: *See*—
Tomosada, Masahiro; Ogawa, Hiroshi; Tohyama, Yoshikuni; Adachi, Hideki; Suzuki, Tadashi; and Ohki, Naoyuki, 4,803,520, Cl. 355-7.000.
Tojo, Yoshikazu: *See*—
Yabe, Hisao; Kimura, Kenji; Kanno, Masahide; Tsuji, Kiyoshi; Yoshinaga, Jun; Yokoi, Takeshi; Ozeki, Kazuhiko; Nishigaki, Shinichi; Nakamura, Takeaki; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,803,550, Cl. 358-98.000.
Tokai TRW & Co., Ltd.: *See*—
Maeda, Naoyuki, 4,802,544, Cl. 180-79.100.
Tokoro, Setsuo: *See*—
Hayashi, Takashi; Tokoro, Setsuo; Watanabe, Tomoyuki; and Shigematsu, Takashi, 4,803,628, Cl. 364-424.100.
Tokugawa, Kazuya: *See*—
Iwatani, Shiro; and Tokugawa, Kazuya, 4,803,377, Cl. 290-38.00R.
Tokushima, Tadao: *See*—
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Tokuyama Soda Kabushiki Kaisha: *See*—
Kato, Shozo, 4,803,223, Cl. 514-521.000.
Takematsu, Tetsuo; Kato, Shozo; Ishizaki, Masahiko; and Suyama, Toshihisa, 4,802,907, Cl. 71-90.000.
Tokyo Kikai Seisakuchi, Ltd.: *See*—
Ohno, Kinichiro; and Kawata, Tomoshi, 4,803,634, Cl. 364-478.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Ohtomo, Fumio; and Otani, Hitoshi, 4,803,645, Cl. 364-560.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Masuoka, Fujio, 4,803,529, Cl. 357-23.500.
Tolles, Edward D., to Westvaco Corporation. Method and apparatus for removing cyanogen chloride from aircu4,802,898, Cl. 55-71.000.
Tomecanic: *See*—
Tondini, Claudio, 4,802,790, Cl. 404-132.000.
Tomic, Branko: *See*—
Maschek, Martin; Mastner, Georg; and Tomic, Branko, 4,802,731, Cl. 350-96.230.
Tominaga, Kanji; Hijikata, Toshihiro; Yamaguchi, Katsuhiro; Matsumoto, Yoshimichi; and Watanabe, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for adjusting tension of timing beltcu4,802,883, Cl. 474-101.000.
Tomioka, Kenichi: *See*—
Mase, Toshiyasu; Tsuzuki, Ryuji; Hara, Hiromu; Murase, Kiyoshi; and Tomioka, Kenichi, 4,803,211, Cl. 514-361.000.
Tomiyama, Yoshio: *See*—
Kourogi, Isao; Masuda, Keiichi; Hirooka, Masami; Tomiyama, Yoshio; Yoshiuchi, Kazunori; and Gokenya, Takashi, 4,802,814, Cl. 414-686.000.
Tomono, Hiroshi: *See*—
Yamada, Tsuneo; Sakashita, Tsutomu; Tomono, Hiroshi; Kimura, Takashi; Machara, Yasuhiro; and Yasumoto, Kunio, 4,802,356, Cl. 72-184.000.
Tomono, Kuniaburo; Mandai, Harufumi; Kawabata, Toshio; Sakamoto, Yukio; Tsunematsu, Toyoaki; and Kaneko, Toshimi, to Murata Manufacturing Co., Ltd. Laminated transformercu4,803,453, Cl. 336-183.000.
Tomosada, Masahiro; Ogawa, Hiroshi; Tohyama, Yoshikuni; Adachi, Hideki; Suzuki, Tadashi; and Ohki, Naoyuki, to Canon Kabushiki Kaisha. Electrophotographic apparatus for making superposed imagescu4,803,520, Cl. 355-7.000.
Tondini, Claudio, to Tomecanic. Vibrating machine for effecting tilingcu4,802,790, Cl. 404-132.000.
Toray Industries Incorporated: *See*—
Amano, Jiro; Shimada, Masato; Takano, Kouzou; and Tohyama, Shunroku, 4,803,116, Cl. 428-286.000.
Tordeux, Marc: *See*—
Francese, Catherine; Tordeux, Marc; and Wakselman, Claude, 4,803,298, Cl. 860-174.000.
Torossian, Kevork A.; Heisler, Ralph T.; and Cox, Frederick E., to General Electric Company. Conductor insulating methodcu4,803,028, Cl. 264-263.000.
Torrington Company Ltd., The: *See*—
Hancock, Michael T., 4,802,881, Cl. 464-93.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Hosoya, Toshio, 4,802,267, Cl. 425-135.000.
Totsuka, Mikio: *See*—
Suzuki, Tamotsu; Shinozaki, Fumiaki; Nishioka, Akira; and Totsuka, Mikio, 4,803,145, Cl. 430-166.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Maruhashi, Yoshitsugu; Iida, Setsuko; Sugisaki, Takashi; Mizutani, Yohji; and Kishida, Nobuhiro, 4,803,036, Cl. 264-526.000.
Toyo Tire & Rubber Company: *See*—
Sogi, Hidehito; and Hori, Toshiyuki, 4,803,118, Cl. 428-246.000.
Toyoboseki Kabushiki Kaisha: *See*—
Ichikawa, Rinjiro; and Ishida, Toshio, 4,802,742, Cl. 350-339.00R.
Toyota Jidosha Kabushiki Kaisha: *See*—
Donomoto, Tadashi, 4,802,524, Cl. 164-97.000.
Hayashi, Takashi; Tokoro, Setsuo; Watanabe, Tomoyuki; and Shigematsu, Takashi, 4,803,628, Cl. 364-424.100.
Ichitani, Yutaka; Imaeda, Masayoshi; Ikeda, Yoshimasa; Nishimura, Yoji; and Seikou, Kiyokazu, 4,802,405, Cl. 98-2.060.
Katayama, Nobuaki; Sasaki, Kan; Koide, Takeharu; and Takimura, Keisuke, 4,802,383, Cl. 74-711.000.
Naruse, Kazuo; Kitano, Mikio; and Tobita, Hideaki, 4,802,616, Cl. 228-4.100.
Okane, Yukihiro; Endo, Koji; and Nakai, Masayoshi, 4,802,456, Cl. 123-564.000.
Tada, Tetsuya; Nagasaka, Masumi; Tabuchi, Hiroaki; and Teratani, Tatsuo, 4,803,637, Cl. 364-426.040.
Takahashi, Takeshi, 4,803,393, Cl. 310-328.000.
Yasuike, Osamu; Arai, Yasuji; Ikemoto, Hiroyuki; Owa, Nobutaka; and Doi, Shunichi, 4,803,627, Cl. 364-424.050.
Tracor Northern, Inc.: *See*—
McCarthy, Jon J.; Fairing, John D.; and Buchholz, Jeffrey C., 4,802,748, Cl. 350-507.000.
Trager, Ulrich: *See*—
Baier, Manfred; Kaspar, Klaus P.; Schafer, Rainer; Trager, Ulrich; and Notzel, Siegfried, 4,803,171, Cl. 436-530.000.
Trans-Guard Industries, Inc.: *See*—
Stevenson, David L.; Moore, Terry R.; and Brammall, Terrence N., 4,802,700, Cl. 292-327.000.
Tree Technologies Corporation: *See*—
Neil, James E.; Demjanenko, Victor; and Caile, Christopher R., 4,803,718, Cl. 379-163.000.
Treece, Lanney C.: *See*—
Steinmetz, Guy R.; Rule, Mark; Agreda, Victor H.; and Treece, Lanney C., 4,803,296, Cl. 560-80.000.
Tri-Albi Corporation: *See*—
Biegel, Donald R., 4,802,427, Cl. 114-61.000.
Tri Tool, Inc.: *See*—
Pol, Jerald V.; Pfafman, Neil; and Silber, Cory J., 4,802,278, Cl. 30-97.000.
Tri-Tronics, Inc.: *See*—
Gonda, Gerald J.; and Farkas, Gregory J., 4,802,482, Cl. 119-29.000.
Trigg, Leonard E. Safety device for subcritical pressure steam boilerscu4,802,446, Cl. 122-504.000.
Trine, John A.; Samdahl, David A.; and Petersen, Daryle L., to Wilbrecht Electronics, Inc. Control switch and potentiometer for hearing aids and the likecu4,803,458, Cl. 338-198.000.
Trine, John A.; and Petersen, Daryle L., to Wilbrecht Electronics, Inc. Mounting bar structure for electrical signalling and indicating devicescu4,803,599, Cl. 362-249.000.
Triplett, James T.: *See*—
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,803,103, Cl. 428-34.500.
Triumph Motorcycles (Coventry) Limited: *See*—
Roberts, John M. L., 4,802,450, Cl. 123-192.00B.
Troup, Gordon J. F.: *See*—
Pilbrow, John R.; Troup, Gordon J. F.; Tirkel, Anatol Z.; Hutton, Donald R.; Gruner, Lucian; and McLaren, Neil R., 4,803,624, Cl. 324-316.000.
Trouve, Patrick: *See*—
Seinera, Henri; Luberne, Patricia; Stock, Claude; and Trouve, Patrick, 4,803,231, Cl. 523-219.000.
True, Thomas T.; and Good, William E., to General Electric Company. Light valve projector having an improved bar plate configurationcu4,802,735, Cl. 350-162.120.
Trump, Thomas R. Heading and distance measuring device and methodcu4,802,283, Cl. 33-431.000.
TRW Inc.: *See*—
Brock, John C., 4,803,686, Cl. 372-44.000.
Tsubaki, Yasuhiro: *See*—
Hagiwara, Haruo; Tsukamoto, Hideo; and Tsubaki, Yasuhiro, 4,802,253, Cl. 8-158.000.
Tsuboi, Shinichi: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,803,277, Cl. 514-332.000.
Tsubosaki, Kunihiro: *See*—
Inayoshi, Hideo; Suzuki, Akira; Tsubosaki, Kunihiro; Ueda, Toyoichi; Makino, Daisuke; Ichimura, Nobuo; and Suzuki, Kazunari, 4,803,543, Cl. 357-72.000.
Tsuchida, Eiharu; and Nagasawa, Hisayoshi, to Kuron Corporation. Overhead blindcu4,802,521, Cl. 160-172.000.
Tsuda, Takashi: *See*—
Yamane, Kazuo; Mori, Masakazu; Tsuda, Takashi; Ohkuma, Yoshinori; and Suzuki, Kazuhiro, 4,803,384, Cl. 307-490.000.
Tsuda, Tatsuya: *See*—
Fujii, Masanobu; and Tsuda, Tatsuya, 4,803,324, Cl. 219-10.55F.
Tsuji, Kiyoshi: *See*—
Yabe, Hisao; Kimura, Kenji; Kanno, Masahide; Tsuji, Kiyoshi; Yoshinaga, Jun; Yokoi, Takeshi; Ozeki, Kazuhiko; Nishigaki,

Shinichi; Nakamura, Takeaki; Tojo, Yoshikazu; and Suzuki, Hiromasa, 4,803,550, Cl. 358-98.000.
Tsuji, Masao: *See*—
Nishida, Yoshie; Hata, Seiji; and Tsuji, Masao, 4,803,735, Cl. 382-8.000.
Tsuji, Masaru: *See*—
Sugimoto, Yuji; Tsuji, Masaru; and Yoshiura, Shoichiro, 4,802,439, Cl. 118-116.000.
Tsuji, Shintaro: *See*—
Umeda, Yasukazu; and Tsuji, Shintaro, 4,802,557, Cl. 187-127.000.
Tsujii, Osamu; and Fujii, Masashi, to Kabushiki Kaisha Toshiba. X-ray inspection apparatuscu4,803,711, Cl. 378-4.000.
Tsujinaka, Hisayuki: *See*—
Onishi, Hiroyuki; Sano, Tetsuo; Hoki, Tetsuo; Kodama, Eiji; Tsujinaka, Hisayuki; and Kitakado, Ryuji, 4,803,734, Cl. 382-8.000.
Tsukada, Eiichi: *See*—
Ogawa, Shigeki; and Tsukada, Eiichi, 4,803,389, Cl. 310-49.00R.
Tsukada, Tokio: *See*—
Inaba, Hiroshi; Shinnai, Masao; Nishikawa, Kazuya; Saitoh, Tamotsu; and Tsukada, Tokio, 4,803,492, Cl. 343-713.000.
Tsukamoto, Hideo: *See*—
Hagiwara, Haruo; Tsukamoto, Hideo; and Tsubaki, Yasuhiro, 4,802,253, Cl. 8-158.000.
Tsunekawa, Yuzo: *See*—
Takayama, Naoto; Tsunekawa, Yuzo; and Kitamura, Kazumi, 4,802,554, Cl. 184-14.000.
Tsunematsu, Toyoaki: *See*—
Tomono, Kunisaburo; Mandai, Harufumi; Kawabata, Toshio; Sakamoto, Yukio; Tsunematsu, Toyoaki; and Kaneko, Toshimi, 4,803,453, Cl. 336-183.000.
Tsuneta, Katsuhiro: *See*—
Haruna, Toshiyuki; Nishimura, Kenji; Yoshida, Yuji; Takahashi, Kiyotaka; Hirose, Tsuneo; Tsuneta, Katsuhiro; Nakano, Riichi; Takahashi, Kazuto; Kurano, Akira; and Ichiba, Tadayuki, 4,803,572, Cl. 360-60.000.
Tsunoda, Toshiyuki: *See*—
Togino, Takayoshi; Fujiwara, Hiroshi; Takabayashi, Yutaka; Nagano, Takashi; Fukaya, Takashi; Minami, Kazuyuki; and Tsunoda, Toshiyuki, 4,802,749, Cl. 350-516.000.
Tsuzuki, Ryuji: *See*—
Mase, Toshiyasu; Tsuzuki, Ryuji; Hara, Hiromu; Murase, Kiyoshi; and Tomioka, Kenichi, 4,803,211, Cl. 514-361.000.
Tu, King-Ning: *See*—
Psaras, Peter A.; Tu, King-Ning; and Thompson, Richard D, 4,803,539, Cl. 357-67.000.
Tuan, Hsing C., to Xerox Corporation. Electrostatic discharge protection network for large area transducer arrayscu4,803,536, Cl. 357-23.130.
Tyler, Thomas R., to Sundstrand Corporation. Centrifugal pump with self-regulating impeller discharge shuttercu4,802,817, Cl. 415-157.000.
Uchiyama, Kunio; Nishimukai, Tadahiko; and Hasegawa, Atsushi, to Hitachi, Ltd.; and Hitachi Microcomputer Eng. Ltd. Buffer memorycu4,803,616, Cl. 364-200.000.
Ueda, Michio, to Shikoku Kakoki Co., Ltd. Apparatus for sterilizing containerscu4,803,055, Cl. 422-297.000.
Ueda, Toyoichi: *See*—
Inayoshi, Hideo; Suzuki, Akira; Tsubosaki, Kunihiro; Ueda, Toyoichi; Makino, Daisuke; Ichimura, Nobuo; and Suzuki, Kazunari, 4,803,543, Cl. 357-72.000.
Uematsu, Takao; Suzuki, Hiroshi; Komatsuzaki, Shigeki; and Nakano, Fumio, to Hitachi, Ltd. Lubricant for cold plastic working of aluminum alloyscu4,803,000, Cl. 252-32.500.
Ueng, Ming-Shean. Mirror assemblies with universal jointscu4,802,751, Cl. 350-626.000.
Uhde, Dietmar; Gleim, Gunter; Schandl, Hartmut; Hoch, Peter; and Lehmann, Rudiger, to Deutsche Thomson-Brandt GmbH. Brushless DC motor system with optically scannable member for commutationcu4,803,408, Cl. 318-254.000.
Ulrich, Thomas J. Method for powering telephone apparatus and telephone apparatus powered directly from the telephone line without external powercu4,803,719, Cl. 379-399.000.
Ultra Diagnostics Corporation: *See*—
Stanton, Thomas H.; Clagett, James A.; Schindele, Deborah C.; Renzoni, George E.; Andersen, Niels H.; and Opheim, Kent E., 4,803,170, Cl. 436-518.000.
Umeda, Yasukazu; and Tsuji, Shintaro, to Mitsubishi Denki Kabushiki Kaisha. Wait time prediction apparatus for elevatorcu4,802,557, Cl. 187-127.000.
Umezaki, Tomokazu, to Mitsubishi Denki Kabushiki Kaisha. Ignition coilcu4,803,454, Cl. 336-192.000.
Umpleby, Jeffrey D., to Union Carbide Corporation. Process for the preparation of thermoplastic elastomerscu4,803,244, Cl. 525-105.000.
Unger, Richard F.: *See*—
Gustafson, Alan D.; and Unger, Richard F., 4,802,342, Cl. 62-239.000.
Uniden Corporation: *See*—
Hikuma, Hideo, 4,803,491, Cl. 343-702.000.
Union Carbide Corporation: *See*—
Goode, Mark G.; Hasenberg, Daniel M.; McNeil, Thomas J.; and Spriggs, Thomas E., 4,803,251, Cl. 526-59.000.
Rosen, Meyer R.; Marlin, Lawrence; and Bracco, Anthony C., 4,802,914, Cl. 75-3.000.
Umpleby, Jeffrey D., 4,803,244, Cl. 525-105.000.
Union Oil Company of California: *See*—
Occelli, Mario L., 4,803,060, Cl. 423-326.000.
Unisys Corp.: *See*—
Flora, Laurence P., 4,803,655, Cl. 364-900.000.
United States of America
Air Force: *See*—
Hayes, Paul C., Jr.; and Anderson, Steven D., 4,802,986, Cl. 210-635.000.
Rhodes, Melvin H., 4,803,701, Cl. 375-102.000.
Energy: *See*—
Gross, Kenny C., 4,803,040, Cl. 376-216.000.
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Wilkinson, James H.; and Avis, Richard J. A., to Sony Corporation. Video replay store for a multi-channel digital video tape recordercu4,803,567, Cl. 360-33.100.
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Willard, David F.: *See*—
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Willhoite, Stanley K.; and McMennamy, Thomas G. Tool for recreational vehiclecu4,802,391, Cl. 81-488.000.
Wm. Wrigley Jr. Company: *See*—
Chapdelaine, Albert H.; Kures, Vasek J.; and Grey, Ronald T., 4,803,083, Cl. 426-3.000.
Williams, George E.: *See*—
Steele, Douglas S.; Howington, Larry C.; Schuler, James W.; Sostarich, Joseph J.; Wojciechowski, Charles R.; Sippel, Theodore W.; Portaz, Joseph M.; Isaacs, Ralph G.; Scudder, Henry J., III; Kincaid, Thomas G.; Hedengren, Kristina H. V.; Koegl, Rudolph A. A.; Keaveney, John P.; Czechowski, Joseph, III; Brehm, John R.; Brown, James M., Jr.; Oliver, David W.; Williams, George E.; and Miller, Richard D., 4,803,639, Cl. 364-507.000.
Williams Gold Refining Company: *See*—
Wilson, Robert; and LaPlante, Jerry C., 4,802,436, Cl. 164-440.000.
Williams, Henry L., to Geolograph Pioneer, Inc. Purge air control systemcu4,802,502, Cl. 137-382.000.

Williams, Logan D. Apparatus for being positioned on an expandable mandrelcu4,802,637, Cl. 242-72.00R.
Williams, Ralph D., to Loggy Bayou Industries. Combined climbing and hang-on tree stand with optional climbing aidcu4,802,552, Cl. 182-187.000.
Williams, Thomas A., III. Reversible unidirectional transmissioncu4,802,387, Cl. 74-812.000.
Williams, Thomas M.: *See*—
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Williamson, Kenneth L. Laboratory glassware equipmentcu4,803,053, Cl. 422-101.000.
Willis, Gordon, to STC PLC. Telephonecu4,803,723, Cl. 379-424.000.
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Wilson, Michael E. Cat litter screening devicecu4,802,442, Cl. 119-1.000.
Wilson, Robert; and LaPlante, Jerry C., to Williams Gold Refining Company; and Rautomead Limited. Continuous casting furnace and die system of modular designcu4,802,436, Cl. 164-440.000.
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Wolk, Frank-Michael; and Zabel, Horst, to Maschinenbau Gabler GmbH. Stacking apparatus for deep-drawn articles of plastics materialcu4,802,808, Cl. 414-789.200.
Wollenberg, Robert H.; and Plavac, Frank, to Chevron Research Company. Modified Succinimidescu4,802,893, Cl. 252-49.600.
Wollenberg, Robert H., to Chevron Research Company. Carbonate treated dispersantscu4,803,002, Cl. 252-49.600.
Wong, David L. W.; Leung, Paul C. P.; and Spissinger, Friederich H. Toy guncu4,802,675, Cl. 273-310.000.
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Young, Peter S.; and Sommargren, Gary E. Differential plane mirror interferometer having beamsplitter/beam folder assemblycu4,802,764, Cl. 356-349.000.
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF FEBRUARY, 1989

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CEM Corporation: *See*—
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Virginia Panel Corporation: *See*—
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Windom, Patricia T. Combined pet food dish and covercu299,768, 2-7-89, Cl. D30-129.000.
Winstead, Ray L. Binocular protective covercu299,682, 2-7-89, Cl. D3-33.000.
Yamase, Shinichi; Tsujui, Hiroaki; and Aoyama, Yoshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Motorcyclecu299,708, 2-7-89, Cl. D12-110.000.
Yoo, Byung K. Water pumpcu299,720, 2-7-89, Cl. D15-7.000.
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Kawamura, Masaki, to Sharp Corporation. Electronic thermometercu299,700, 2-7-89, Cl. D10-57.000.
Yukawa, Masayuki, to Nintendo Co., Ltd. Video game control unitcu299,726, 2-7-89, Cl. D21-1.000.

LIST OF PLANT PATENTEES

Ball Pan Am Plant Co.: *See*—
Jordan, Christine; and Satory, Marie, 6,589, Cl. 78.000.
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Denholm Seeds: *See*—
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Marciel, Stanley G., 6,582, Cl. 16.000.
Marciel, Stanley G., 6,583, Cl. 7.000.
Marciel, Stanley G., 6,584, Cl. 10.000.

Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara": *See*—
Holtkamp, Reinhold, Sr., 6,587, Cl. 69.000.

Gross, Eduard. Poinsettia named Supjibicu6,592, 2-7-89, Cl. 86.000.

Hauenstein A.G.: *See*—
Hauenstein, Walter, 6,588, Cl. 34.000.

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Haver, Herman H. Maple tree named Mareltoicu6,594, 2-7-89, Cl. 51.000.

Holtkamp, Reinhold, Sr., to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant named Sonjacu6,587, 2-7-89, Cl. 69.000.

Jordan, Christine; and Satory, Marie, to Ball Pan Am Plant Co. Chrysanthemum plant named Golden Geoscu6,589, 2-7-89, Cl. 78.000.

Marciel, Stanley G., to DeVor Nurseries, Inc. Rose plant named De Vorancu6,582, 2-7-89, Cl. 16.000.

Marciel, Stanley G., to DeVor Nurseries, Inc. Rose plant named Devauroracu6,583, 2-7-89, Cl. 7.000.

Marciel, Stanley G., to DeVor Nurseries, Inc. Rose plant named De Vrojocu6,584, 2-7-89, Cl. 10.000.

Mayer, Eugene W.: *See*—
Meier, Virgil D.; Turner, James K.; and Mayer, Eugene W., 6,585, Cl. 88.000.

Meier, Virgil D.; Turner, James K.; and Mayer, Eugene W., to O.M. Scott & Sons Company, The. Kentucky bluegrasscu6,585, 2-7-89, Cl. 88.000.

Muldoon, Jackson P. Bedding viola named 'Black Magic'cu6,595, 2-7-89, Cl. 68.000.

O.M. Scott & Sons Company, The: *See*—
Meier, Virgil D.; Turner, James K.; and Mayer, Eugene W., 6,585, Cl. 88.000.

Satory, Marie: *See*—
Jordan, Christine; and Satory, Marie, 6,589, Cl. 78.000.

Sueptitz, Dieter, to Ball Pan Am Plant Co. Chrysanthemum plant named Antoniocu6,590, 2-7-89, Cl. 74.000.

Sueptitz, Dieter, to Ball Pan Am Plant Co. Chrysanthemum plant named Golden Antoniocu6,591, 2-7-89, Cl. 74.000.

Turner, James K.: *See*—
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VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Yellow Ovarocu6,581, 2-7-89, Cl. 78.000.

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Williams, J. Benjamin. Rose plantcu6,596, 2-7-89, Cl. 4.000.

Winner, Blair L., to Denholm Seeds. Variety of geranium named Mandarincu6,593, 2-7-89, Cl. 68.000.

Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 6,581, Cl. 78.000.
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LIST OF STATUTORY INVENTION REGISTRATIONS

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Asami, Masahiro. Silver halide color photographic materialcuH583, 2-7-89, Cl. 430-550.000.

Behl, Wishvender K.; and Chin, Der-Tau, to United States of America, Army. Electrolyte additive for lithium rechargeable organic electrolyte batterycuH578, 2-7-89, Cl. 429-197.000.

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Chiles, Marion M.; Mihalczo, John T.; and Blakeman, Edward D., to United States of America, Energy. High-efficiency scintillation detector for combined of thermal and fast neutrons and gamma radiationcuH590, 2-7-89, Cl. 250-367.000.

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Fidelle, Thomas P.; and Nulph, Robert J., to Great Lakes Chemical Corporation. Highly flame retarded flexible polyvinyl chloride compositions and methods for producing samecuH579, 2-7-89, Cl. 524-288.000.

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Hansen, Anthony D., to United States of America, Energy. Optical analyzercuH572, 2-7-89, Cl. 356-439.000.

Hollinger, Jeffrey O.; Schmitz, John P.; and Koppelman, Eric S., to United States of America, Army. Double-bladed, water-cooled attachment for surgical bone cutting saw and method for using and assembling the samecuH571, 2-7-89, Cl. 128-317.000.

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Kun, Randall D. ISDN D channel handlercuH586, 2-7-89, Cl. 370-94.000.

Latham, Paul W., II, to Data General Corporation. Transversal filter used as an equalizer for data readout from a disk drivecuH588, 2-7-89, Cl. 360-65.000.

Merkel, Harold S.; and Ramer, David P., to United States of America, Air Force. Subject operated pupilometercuH574, 2-7-89, Cl. 351-223.000.

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Painter, James H., to United States of America, Air Force. Dual toroidal electrodescuH587, 2-7-89, Cl. 219-75.000.

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Turner, S. Richard: *See*—
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6 4,802,460
7 4,802,461
24.1 4,802,470
25 R 4,802,462
36 4,802,463
71 4,802,464
4,802,465
80 C 4,802,466
88 4,802,467
92 V 4,802,468
98.1 4,802,469
200.26 4,802,474
204.18 4,802,472
206.19 4,802,473
303.1 4,802,475
303.14 4,802,476
317 4,802,477
334 R 4,802,478
344 4,802,479
400 4,802,480
419 PG 4,802,481
4,802,483
630 4,802,484
633 4,802,485
4,802,486
661.08 4,802,458
4,802,490
662.06 4,802,487
672 4,802,488
691 4,802,489
702 4,802,491
720 4,802,492
743 4,802,493
779 4,802,494

CLASS 130

9 B 4,802,495
27 S 4,802,496

CLASS 131

109.1 4,802,497
359 4,802,498

CLASS 134

6 4,802,927
15 4,802,928

CLASS 135

24 4,802,499
97 4,802,500
109 4,802,501

CLASS 136

205 4,802,929

CLASS 137

382 4,802,502
413 4,802,503
454.5 4,802,504
492 4,802,505
556 4,802,506
613 4,802,507
624.13 4,802,508

CLASS 138

110 4,802,509
118.1 4,802,511
125 4,802,510

CLASS 140

149 4,802,512

CLASS 141

86 4,802,514
97 4,802,515
311 R 4,802,513
392 4,802,516

CLASS 144

34 E 4,802,517
193 R 4,802,518

CLASS 148

12.7 B 4,802,930
23 4,802,932
302 4,802,931
403 4,802,933
404 4,802,934
437 4,802,935

CLASS 152

325 4,802,519
454 4,802,520

CLASS 156

64 4,802,936
118 4,802,937
149 4,802,938
155 4,802,939
187 4,802,940
244.13 4,802,942
244.18 4,802,941
244.23 4,802,943
247 4,802,944
4,802,945
264 4,802,946
380.5 4,802,947
500 4,802,948
540 4,802,949
629 4,802,950
630 4,802,951
634 4,802,952

CLASS 160

168.1 4,802,522
172 4,802,521
354 4,802,523

CLASS 162

263 4,802,953
301 4,802,955
348 4,802,954

CLASS 164

48 4,802,525
97 4,802,524
287 4,802,526
358 4,802,527
428 4,802,528
440 4,802,436

CLASS 165

29 4,802,529
80.3 4,802,532
94 4,802,530
104.28 4,802,531

CLASS 166

252 4,802,533
381 4,802,534

CLASS 169

70 4,802,535

CLASS 172

42 4,802,536
812 4,802,537

CLASS 173

1 4,802,538

CLASS 174

35 GC 4,803,306
67 4,803,307
68.5 4,803,308
106 R 4,803,309
128 S 4,803,310
182 4,803,311

CLASS 175

329 4,802,539

CLASS 177

211 4,802,540
212 4,802,541

CLASS 178

17 R 4,803,312

CLASS 180

65.5 4,802,542
79.1 4,802,543
4,802,544
132 4,802,546
135 4,802,545
216 4,802,547
219 4,802,682
274 4,802,548
322 4,802,549

CLASS 181

131 4,802,550
146 4,802,551

CLASS 182

187 4,802,552
204 4,802,471
222 4,802,553

CLASS 184

14 4,802,554
15.1 4,802,555
102 4,802,556

CLASS 187

127 4,802,557

CLASS 188

134 4,802,558
196 A 4,802,559
264 F 4,802,560
318 4,802,561

CLASS 192

1.23 4,802,562
13 A 4,802,563
70.28 4,802,564

CLASS 194

350 4,802,566

CLASS 198

345 4,802,565
4,802,567
346.1 4,802,569
388 4,802,568
627 4,802,571
791 4,802,572

CLASS 200

5 A 4,803,315
6 BB 4,803,313
11 J 4,803,314
82 R 4,803,318
147 A 4,803,319
268 4,803,322
302.2 4,803,323
342 4,803,320
406 4,803,316
438 4,803,317
517 4,803,321

CLASS 201

39 4,802,573

CLASS 203

42 4,802,956

CLASS 204

1 T 4,802,957
60 4,802,970
80 4,802,958
82 4,802,959
98 4,802,960
109 4,802,961
145 R 4,802,962
157.5 4,802,963
180.1 4,802,964
182.4 4,802,965
4,802,966
192.14 4,802,967
192.2 4,803,130
298 4,802,968
299 R 4,802,969

CLASS 206

204 4,802,574
225 4,802,576
232 4,802,575
278 4,802,577
339 4,802,578
366 4,802,579
378 4,802,580
380 4,802,581
390 4,802,582
427 4,802,583
444 4,802,587
447 4,802,584
449 4,802,585
511 4,802,588
4,802,589
556 4,802,586
620 4,802,590

CLASS 208

13 4,802,971
107 4,802,972
207 4,802,973
217 4,802,974
390 4,802,975

CLASS 209

12 4,802,976
143 4,802,977
680 4,802,591

CLASS 210

104 4,802,978
132 4,802,979
169 4,802,592
4,802,980
198.2 4,802,981
247 4,802,982
490 4,802,984
502.1 4,802,985
635 4,802,986
640 4,802,987
4,802,988
688 4,802,989
699 4,802,990
705 4,802,991
709 4,802,992
725 4,802,993
759 4,802,994
761 4,802,995
764 4,802,996

CLASS 211

10 4,802,593
20 4,802,594
88 4,802,595
197 4,802,596

CLASS 215

307 4,802,597
348 4,802,598

CLASS 219

10.55 F 4,803,324
64 4,803,325
69 W Re.32,855
4,803,326
4,803,327
4,803,328
86.25 4,803,329
97 4,803,330
110 4,803,331
121.13 4,803,333
121.52 4,803,332
121.64 4,803,334
121.68 4,803,336
121.84 4,803,335
121.85 4,803,337
145.21 4,803,339
146.1 4,803,340
222 4,803,341
257 4,803,342
326 4,803,343
497 4,803,344
553 4,803,345

CLASS 220

1 C 4,802,599
1.5 4,802,600
4 R 4,802,601
85 H 4,802,602
268 4,802,603
324 4,802,604
338 4,802,605

CLASS 221

39 4,802,606

CLASS 222

82 4,802,607
142.1 4,802,608
158 4,802,609
481.5 4,802,610
600 4,802,611

CLASS 224

204 4,802,613
208 4,802,612

CLASS 227

19 4,802,614
67 4,802,615

CLASS 228

4.1 4,802,616
180.1 4,802,617

CLASS 229

68 R 4,802,618
125.19 4,802,619
125.42 4,802,620

CLASS 235

7 R 4,803,346
379 4,803,347
381 4,803,348
475 4,803,349
492 4,803,350
4,803,351

CLASS 236

93 R 4,802,621

CLASS 238

10 R 4,802,622
44 4,802,623
317 4,802,624

CLASS 239

3 4,802,625
36 4,802,626
112 4,802,627
227 4,802,628
265.19 4,802,629
428 4,802,630

CLASS 241

30 4,802,635
88.1 4,802,631

CLASS 242

58.5 4,802,632
67.1 R 4,802,636
71.1 4,802,633
72 R 4,802,637
85.1 4,802,638
107.4 A 4,802,634

CLASS 244

2 4,802,639
3.19 4,802,640
137.4 4,802,641
200 4,802,642

CLASS 248

49 4,802,643
251 4,802,644
309.1 4,802,645
316.5 4,802,646
544 4,802,647
550 4,802,648

CLASS 249

21 4,802,649

CLASS 250

201 4,803,352
227 4,803,353
4,803,361
229 4,803,362
231 SE 4,803,354
236 4,803,367
288 4,803,355
306 4,803,356
310 4,803,357
4,803,358
4,803,369
327.2 4,803,359
338.3 4,803,360
338.4 4,803,363
385.1 4,803,368
455.1 4,803,364
461.2 4,803,365
486.1 4,803,366
504 R 4,803,370
560 4,803,371
561 4,803,372
4,803,373
571 4,803,374
578 4,803,375

CLASS 251

117 4,802,650
161 4,802,651
181 4,802,652

CLASS 252

8.514 4,802,998
8.6 4,802,997
18 4,802,999
32.5 4,803,000
47 4,803,001
49.6 4,802,893
4,803,002
51.5 A 4,803,003
4,803,004
58 4,803,005
62.51 4,803,006
70 4,803,007
135 4,803,058
162 4,803,008
171 4,803,009
174.21 4,803,010
500 4,803,011
544 4,803,012
580 4,803,013
585 4,803,014

CLASS 254

126 4,802,653

CLASS 260

402 4,803,015
403 4,803,016
501.15 4,803,017

CLASS 261

111 4,803,018

CLASS 264

3.1 4,803,019
3.3 4,803,038
22 4,803,020
25 4,803,021
4,803,022
45.4 4,803,023
63 4,803,025
80 4,803,024
210.5 4,803,027
216 4,803,026
255 4,803,031
263 4,803,028
264 4,803,029
278 4,803,030
284 4,803,032
339 4,803,033
504 4,803,034
519 4,803,035
526 4,803,036

CLASS 266

51 4,802,654
78 4,803,037
218 4,802,655
225 4,802,656

CLASS 267

64.24 4,802,657
140.1 4,802,658
149 4,802,659
182 4,802,660

CLASS 269

48.1 4,802,661

CLASS 271

20 4,802,662
201 4,802,664
225 4,802,665
227 4,802,663

CLASS 272

73 4,802,666
123 4,802,667

CLASS 273

1 GE 4,802,668
26 C 4,802,669
55 R 4,802,670
63 E 4,802,671
73 D 4,802,678
77 A 4,802,672
94 4,802,880
153 S 4,802,673
235 A 4,802,674
310 4,802,675
363 4,802,676
416 4,802,677

CLASS 277

12 4,802,679

CLASS 279

33 4,802,680

CLASS 280

47.18 4,802,681
291 4,802,684
304.1 4,802,683
414.1 4,802,685
477 4,802,686
615 4,802,687
666 4,802,688
688 4,802,689
713 4,802,690
751 4,802,691

CLASS 281

5 4,802,692
7 4,802,693

CLASS 285

87 4,802,694
91 4,802,695
317 4,802,696
319 4,802,697
363 4,802,698

CLASS 290

22 4,803,376
38 R 4,803,377

CLASS 292

327 4,802,699
4,802,700
340 4,802,701

CLASS 294

65.5 4,802,702
99.2 4,802,703
4,802,704

CLASS 296

39.2 4,802,705
68 4,802,706
214 4,802,707

CLASS 297

252 4,802,708

CLASS 298

10 4,802,709

CLASS 303

11 4,802,710
96 4,802,711
114 4,802,712
119 4,802,713

CLASS 307

108 4,803,378
112 4,803,379
157 4,803,380
228 4,803,381
362 4,803,382
456 4,803,383
490 4,803,384
516 4,803,385
530 4,803,386

CLASS 310

12 4,803,387
4,803,388
49 R 4,803,389
50 4,803,390
178 4,803,391
311 4,803,392
328 4,803,393

CLASS 312

196 4,802,714
299 4,802,715
330 R 4,802,716

CLASS 313

113 4,803,394
141 4,803,395
318 4,803,396
337 4,803,397
4,803,398
489 4,803,400
4,803,401
493 4,803,399
509 4,803,402
624 4,803,403
634 4,803,404

CLASS 315

111.21 4,803,405
174 4,803,406
364 4,803,407

CLASS 318

254 4,803,408
310 4,803,409
331 4,803,410
564 4,803,411
567 4,803,412
648 4,803,413
696 4,803,414
4,803,415

CLASS 320

44 4,803,416
48 4,803,417

CLASS 322

61 Re.32,857

CLASS 323

284 4,803,612
324 4,803,418

CLASS 324

58 R 4,803,419
64 4,803,420
72 4,803,421
73 R 4,803,422
130 4,803,423
158 F 4,803,424
173 4,803,425
207 4,803,426
4,803,427
230 4,803,428
244 4,803,429
250 4,803,430
306 4,803,431
309 4,803,432
316 4,803,624
318 4,803,433
424 4,803,434
456 4,803,435
549 4,803,436

CLASS 328

59 4,803,437

CLASS 329

50 4,803,438

CLASS 330

4.3 4,803,439
145 4,803,440
257 4,803,441
274 4,803,442
277 4,803,443

CLASS 331

65 4,803,444
177 R 4,803,445

CLASS 333

26 4,803,446
103 4,803,447
151 Re.32,859
4,803,448
193 4,803,449
238 4,803,450

CLASS 335

261 Re.32,860
273 4,803,451
301 4,803,452

CLASS 336

183 4,803,453
192 4,803,454

CLASS 337

68 4,803,455

CLASS 338

32 S 4,803,456
195 4,803,457
198 4,803,458

CLASS 340

52 R 4,803,459
63 4,803,460
507 4,803,465
539 Re.32,856
542 4,803,467
566 4,803,468
577 4,803,469
583 4,803,470
603 4,803,466
626 4,803,471
658 4,803,472
693 4,803,473
709 4,803,474
726 4,803,478
732 4,803,464
747 4,803,477
750 4,803,475
4,803,476
784 4,803,480
825.050 4,803,485
825.31 4,803,482
825.440 4,803,487
825.5 4,803,481
825.79 4,803,486
856 4,803,483
860 4,803,479
870.02 4,803,484
904 4,803,488

CLASS 341

23 4,803,463
154 4,803,461
172 4,803,462

CLASS 342

158 4,803,490
192 4,803,489

CLASS 343

702 4,803,491
713 4,803,492
745 4,803,493
770 4,803,494
777 4,803,495

CLASS 346

76 PH 4,803,496
108 4,803,497
4,803,498
140 R 4,803,499
4,803,500
4,803,501
4,803,502
159 4,803,503

CLASS 350

1.3 4,802,717
3.6 4,802,718
3.65 4,802,719
6.6 4,802,720
6.8 4,802,721
96.10 4,802,722
96.15 4,802,723
96.20 4,802,724
4,802,725
4,802,726
4,802,727
4,802,728
96.21 4,802,729
96.23 4,802,730
4,802,731
4,802,732
96.34 4,802,733
117 4,802,734
162.12 4,802,735
163 4,802,736
166 4,802,737
257 4,802,738
332 4,802,739
339 F 4,802,743
4,802,744
339 R 4,802,742
341 4,802,740
392 4,802,741
397 4,802,745
418 4,802,746
427 4,802,747

507 4,802,748
516 4,802,749
619 4,802,750
626 4,802,751
631 4,802,752

CLASS 351

88 4,802,753
138 4,802,754
163 4,802,755
200 4,802,756

CLASS 354

64 4,803,504
80 4,803,505
400 4,803,506
4,803,507
403 4,803,508
410 4,803,509

CLASS 355

3 CH 4,803,512
4,803,517
3 DD 4,803,513
3 R 4,803,510
4,803,511
4 4,803,514
4,803,515
4,803,516
4,803,518
7 4,803,520
8 4,803,519
14 R 4,803,521
26 4,803,522
32 4,803,523
53 4,803,524
55 4,803,525

CLASS 356

2 4,802,757
31 4,802,760
71 4,802,758
301 4,802,761
318 4,802,762
319 4,802,763
349 4,802,764
4,802,765
350 4,802,766
4,802,767
376 4,802,759
417 4,802,768

CLASS 357

13 4,803,527
15 4,803,526
23.1 4,803,528
23.13 4,803,536
23.4 4,803,533
23.5 4,803,529
23.6 4,803,535
23.7 4,803,530
24 4,803,531
30 4,803,537
38 4,803,538
67 4,803,539
68 4,803,541
70 4,803,540
71 4,803,534
72 4,803,542
4,803,543
4,803,544
81 4,803,545
4,803,546
234 4,803,532

CLASS 358

31 4,803,547
36 4,803,548
39 4,803,549
98 4,803,550
4,803,562
100 4,803,563
147 4,803,551
148 4,803,552
149 4,803,553
209 4,803,554
213.19 4,803,555
228 4,803,556
229 4,803,557
236 4,803,560
248 4,803,559
283 4,803,558
285 4,803,561
294 4,803,564
300 4,803,565

CLASS 360

26 4,803,566
33.1 4,803,567
4,803,568
60 4,803,569
4,803,572
61 4,803,570
63 4,803,571
78.13 4,803,573
85 4,803,574
94 4,803,575
96.3 4,803,585
99.08 4,803,576
102 4,803,577
105 4,803,578
113 4,803,580
4,803,581
114 4,803,579
119 4,803,582
122 4,803,338
128 4,803,583
133 4,803,584

CLASS 361

18 4,803,586
24 4,803,587
79 4,803,592
118 4,803,588
210 4,803,589
225 4,803,593
230 4,803,594
321 4,803,591
386 4,803,590
412 4,803,595
502 4,803,597
525 4,803,596
541 4,803,598

CLASS 362

72 4,803,608
80 4,803,601
135 4,803,602
150 4,803,603
154 4,803,604
184 4,803,605
217 4,803,600
249 4,803,599
250 4,803,606
4,803,607

CLASS 363

17 4,803,609
70 4,803,610
98 4,803,611

CLASS 364

132 4,803,613
200 4,803,614
4,803,615
4,803,616
4,803,617
4,803,618
4,803,619
4,803,620
4,803,621
4,803,622
4,803,623
413.03 4,803,625
424.05 4,803,627
4,803,629
4,803,630
424.07 4,803,626
424.1 4,803,628
426.04 4,803,637
462 4,803,631
464.04 4,803,632
474.03 4,803,633
478 4,803,634
483 4,803,635
491 4,803,636
507 4,803,638
4,803,639
513 4,803,640
4,803,641
4,803,642
523 4,803,643
559 4,803,644
560 4,803,645
561 4,803,646
567 Re.32,861
708 4,803,652
716 Re.32,858
724.17 4,803,647
724.19 4,803,648
784 4,803,649
825 4,803,650
900 4,803,651
4,803,653
4,803,654
4,803,655

CLASS 365

87 4,803,658
94 4,803,659
113 4,803,660
184 4,803,661
185 4,803,662
189 4,803,663
200 4,803,656
210 4,803,664
221 4,803,657
230 4,803,665

CLASS 366

75 4,802,769
177 4,802,770
270 4,802,771

CLASS 367

36 4,803,666
69 4,803,667
72 4,803,668
4,803,669
99 4,803,670
166 4,803,671

CLASS 368

241 4,803,672
269 4,803,673

CLASS 369

13 4,803,674
32 4,803,675
44 4,803,677
143 4,803,676
291 4,803,678

CLASS 370

85 4,803,681
95 4,803,679
102 4,803,680

CLASS 371

12 4,803,682
19 4,803,683
31 4,803,684
33 4,803,685

CLASS 372

5 4,803,687
21 4,803,688
36 4,803,689
44 4,803,686
45 4,803,690
50 4,803,692
58 4,803,693
92 4,803,695
95 4,803,696
98 4,803,694
107 4,803,697
150 4,803,691

CLASS 373

27 4,803,698

CLASS 374

205 4,802,772

CLASS 375

36 4,803,699
77 4,803,700
102 4,803,701
106 4,803,702
116 4,803,703
120 4,803,704
4,803,705

CLASS 376

216 4,803,039
4,803,040
261 4,803,041
272 4,803,042
442 4,803,043
444 4,803,044

CLASS 377

24.1 4,803,707
28 4,803,708
58 4,803,709
60 4,803,710
63 4,803,706

CLASS 378

4 4,803,711
34 4,803,713
62 4,803,714
90 4,803,715
034 4,803,712
155 4,803,716

CLASS 379

67 4,803,717
163 4,803,718
202 4,803,720
399 4,803,719
4,803,721
413 4,803,722
424 4,803,723
433 4,803,724

CLASS 380

44 4,803,725
48 4,803,726

CLASS 381

1 4,803,727
25 4,803,728
43 4,803,729
49 4,803,730
63 4,803,731
68.2 4,803,732
193 4,803,733

CLASS 382

8 4,803,734
4,803,735
22 4,803,736
65 4,803,737

CLASS 383

16 4,802,773

CLASS 384

12 4,802,774
450 4,802,775

CLASS 400

124 4,802,776
4,802,781
144.2 4,802,777
496 4,802,779
624 4,802,778
643 4,802,780
660 4,802,795

CLASS 401

122 4,802,797
138 4,802,782

CLASS 402

1 4,802,789

CLASS 403

2 4,802,783
24 4,802,784
27 4,802,785
232.1 4,802,786

CLASS 404

90 4,802,787
94 4,802,788
132 4,802,790

CLASS 405

53 4,802,792
63 4,802,791
161 4,802,793
168 4,802,794

CLASS 406

141 4,802,796

CLASS 408

112 4,802,798
144 4,802,799

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	4,802,508		4,802,801		4,803,490	10 :	4,802,330	16 :	4,802,474		4,802,927
	4,802,640		4,802,805		4,803,495		4,802,346		4,802,670		4,803,166
	4,802,678		4,802,809		4,803,536		4,802,413	17 :	4,802,354		4,803,417
	4,802,930		4,802,812		4,803,547		4,802,906		4,802,389	19 :	4,802,517
	4,803,307		4,802,813		4,803,566		4,802,908		4,802,393		4,802,626
	4,803,413		4,802,816		4,803,603		4,802,911		4,802,411		4,802,685
	4,803,652		4,802,826		4,803,612		4,803,009		4,802,496		4,802,705
05 :	4,802,553		4,802,846		4,803,621		4,803,101		4,802,537		4,802,708
06 :	4,802,248		4,802,856		4,803,632		4,803,163		4,802,549		4,803,701
	4,802,250		4,802,866		4,803,641		4,803,209		4,802,677	20 :	4,802,265
	4,802,258		4,802,870		4,803,644		4,803,272		4,802,684		4,802,288
	4,802,277		4,802,875		4,803,655		4,803,304		4,802,696		4,802,293
	4,802,278		4,802,893		4,803,659	11 :	4,802,593		4,802,792		4,802,357
	4,802,284		4,802,912		4,803,661	12 :	4,802,260		4,802,799	21 :	4,802,254
	4,802,301		4,802,945		4,803,686		4,802,303		4,802,807		4,802,402
	4,802,302		4,802,967		4,803,691		4,802,315		4,802,817		4,802,499
	4,802,304		4,802,968		4,803,694		4,802,334		4,802,864		4,802,522
	4,802,306		4,802,982		4,803,696		4,802,463		4,802,877	22 :	4,802,552
	4,802,310		4,803,002		4,803,699		4,802,467		4,802,878		4,802,855
	4,802,314		4,803,022		4,803,702		4,802,481		4,802,879		4,803,261
	4,802,316		4,803,048	08 :	4,802,317		4,802,569		4,802,972	23 :	4,802,297
	4,802,345		4,803,049		4,802,364		4,802,638		4,802,975	24 :	4,802,276
	4,802,353		4,803,050		4,802,444		4,802,679		4,802,980		4,802,472
	4,802,362		4,803,060		4,802,492		4,802,683		4,802,992		4,802,515
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	4,802,397		4,803,085		4,802,651		4,802,772		4,802,995		4,802,693
	4,802,415		4,803,102		4,802,897		4,802,782		4,802,996		4,802,854
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	4,802,442		4,803,173		4,803,435		4,803,364		4,803,083		4,803,202
	4,802,449		4,803,175		4,803,707		4,803,391		4,803,087		4,803,658
	4,802,468		4,803,254	09 :	4,802,283		4,803,396		4,803,094	25 :	4,802,255
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	4,802,533		4,803,336		4,802,730	13 :	4,802,343		4,803,545		4,802,459
	4,802,540		4,803,339		4,802,764		4,802,425		4,803,625		4,802,461
	4,802,560		4,803,348		4,802,765		4,802,514		4,803,626		4,802,491
	4,802,575		4,803,362		4,802,823		4,802,582		4,803,726		4,802,507
	4,802,587		4,803,363		4,802,828		4,802,583		4,803,730		4,802,650
	4,802,588		4,803,368		4,802,937		4,802,631	18 :	Re.32,856		4,802,720
	4,802,607		4,803,419		4,802,969		4,802,672		4,802,266		4,802,984
	4,802,609		4,803,425		4,803,045		4,802,691		4,802,338		4,803,053
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DESIGN PATENTS

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09 : 299,692
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13 : 299,725
15 : 299,722
17 : 299,687
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20 : 299,743
21 : 299,693
22 : 299,704
25 : 299,681
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26 : 299,758
29 : 299,702
32 : 299,683

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36 : 299,731
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39 : 299,711
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41 : 299,770
42 : 299,682
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45 : 299,712

47 : 299,738
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299,777
51 : 299,715
55 : 299,689
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299,757

PLANT PATENTS

06 : 6,581
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6,583
6,584
6,586
6,593
24 : 6,596
31 : 6,594
39 : 6,585
41 : 6,595

STATUTORY INVENTION REGISTRATIONS

06 : H572
18 : H579
24 : H571
H575
H581
H585
29 : H587
33 : H588
34 : H577
H578
H580
H584
39 : H589
47 : H574
H590
48 : H573
H582

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